

# The Research on Competition Strategy of Traditional Retailers and Omni-channel Retailers In Internet Plus Era

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**Key words:** Internet; Omni-channel retailers; Hotelling

**Abstract:** The development of retailers has brought unprecedented impact and challenges in the Internet plus era, this paper used Hotelling model as the theoretical basis, established the utility model and the demand model of consumers, compared utility and profit between the traditional retailer and Omni-channel retailer, researched competition strategy of traditional retailers and Omni-channel retailers, so that find out under what condition can the traditional retailers transformation to Omni-channel retailers, and give some suggestions for traditional retailers transformation to Omni-channel retailers .

## Introduction

In the Internet plus era, with the development of Internet technology, Omni-channel retail model of Internet plus retail is rising in our country, retailers rely on Internet technology integrated into the Omni-channel mode of consumption is gradually forming. Therefore, It is extremely urgent to research on the strategy of the Omni-channel retail mode for the transformation of traditional retail enterprises. The so-called Omni-channel retail model, it is the enterprise in order to meet the consumer at any time, any place, any way of shopping needs, take traditional channels, e-commerce channels and integrated channel of the mobile terminal sale goods or services, to give consumers a hitherto unknown seamless shopping experience .

### Problems raised

Under the background of the internet plus era, more and more consumers began to use the entity store, online store, mobile terminal store and social media store to shopping together. At the same time, along with our country city continues to expand the scale, consumers travel shopping cost is also becoming higher and higher, the use of the virtual channels such as e-commerce channels and mobile terminal channels has become the majority of consumers shopping choose in our country. According to the Chinese Internet Network Information Center (CNNIC) thirty-ninth Chinese Internet development statistics report released, until December 2016, China internet users have reached 731 million, equivalent to the total population of Europe, the Internet penetration rate reached 53.2%. The number of China's mobile phone users has reached 695 million, the growth rate reached more than 10% for three consecutive years. At the same time, the relationship between mobile Internet and offline economic is getting closer , in 2016, the scale of China's mobile phone online payment users have rapidly growth to 469 million, the annual growth rate is 31.2%, the ratio of online payment mobile phone users increased from 57.7% to 67.5%. Rapid infiltration from mobile payment to offline payment, greatly enriched the payment scenario, there are 50.3% users using mobile payment settlement in the entity store.

In the real shopping scene, shopping is often not a easy thing that can make a quick decision in a short time, consumers often hesitate and wander between many similar products. The typical example is women buy clothes process, in traditional retail mode, consumers often spend some cost of transportation from the remote suburbs to the city shopping center, and walk around many stores, then buy again back to the earlier visited store, or stroll nothing through shops still returning home, after think carefully, and finally go out to spend some cost to the entity store to buy. But in the Omni-channel retail era, consumers have a seamless shopping experience more diverse and more convenient, consumers can experience consumption feelings in many entity stores, and complete the final payment through e-commerce channels and mobile terminal channels, without having to return to the entity store to buy goods, the selected goods finally delivered to our customers through the convenient logistics channel. This shopping model, in the current rapid pace of life in large cities, can greatly reduce consumers cost of transportation and time costs, and bring consumers a more convenient and enjoyable shopping experience.

This paper considered the competition between traditional entity retailer and Omni-channel retailer which in the same location in the Internet plus background, this paper used Hotelling model as the theoretical basis, establish the utility model and the demand model of consumers, compared utility and profit between the traditional retailer and Omni-channel retailer, researched competition strategy of traditional retailers and Omni-channel retailers, so that find out under what condition can the traditional retailers transformation to Omni-channel retailers, and give some suggestions for traditional retailers transformation to Omni-channel retailers.

### **Research on the competitive strategy of traditional retailers and Omni-channel retailers**

**Problems description and model construction.** The assumption that the consumers are uniformly distributed along the length of 1 "linear city", in the city there is a traditional retailer  $A$  that can only provide entity shopping store and an Omni-channel retailer  $B$  that can provide entity channels, e-commerce channels, mobile terminals and other shopping channels. Assuming that the value of goods for consumers when shopping is  $\theta (\theta > 0)$ , the sales price of the commodity is  $p (p > 0)$ , the cost of commodity is  $c (0 < c < p)$ , transportation cost coefficient of customers to the store is  $t (t > 0)$ , the transportation cost when the consumer  $x$  away from the retailer go to traditional retailer to buy goods is  $tx (t > 0)$ , the cost is proportional to the distance between the consumer and the retailer, distribution costs for consumers to choose home delivery mode is  $k (k > 0)$ .

Based on the above assumptions, set up the consumption scenario for the purchase of clothing mentioned above, at the same time, assumptions the traditional retailer  $A$  and Omni-channel retailer  $B$  are selling the same clothes, a consumer located in  $x$  spent some transportation cost to the city shopping center at a time, and went to two entity stores to experience the effect of the upper body clothe, then returned home, after repeated comparisons clothes, finally decide to buy a cloth which retailers  $A$  and retailers  $B$  are both selling. At this point, the utility model of the traditional retailer  $A$  and the Omni-channel retailer  $B$  is as follows: (to simplify the model, if the customer returns to the store to buy the clothes, the default choice is traditional retailer  $A$ ).

$$\begin{cases} U_a = \theta - p - 2tx \\ U_b = \theta - p - tx - k \end{cases}$$

Proposition 1: in the position of  $x < \frac{k}{t}$ , consumers will choose back to the traditional retailer A to buy goods.

Prove: In the condition of  $x < \frac{k}{t}$ , the consumer utility function can be obtained is  $U_a > U_b$ , consumers will choose back to the traditional retailers A to buy goods.

Proposition 2: in the condition of  $x > \frac{k}{t}$ , consumers will choose back to the Omni-channel retailer B to buy goods.

Prove: in the condition of  $x > \frac{k}{t}$ , the consumer utility function can be obtained is  $U_b > U_a$ , consumers will choose back to the Omni-channel retailer B to buy goods.

Proposition 3: in the condition of  $x = \frac{k}{t}$ , consumers will buy in any one of the traditional retailer A and Omni-channel retailer B.

Prove: in the condition of  $x = \frac{k}{t}$ , the consumer utility function can be obtained is  $U_a = U_b$ , the utility of the two retailers for consumers are equal, so consumers will buy in any one of the traditional retailer A and Omni-channel retailer B.

### **Analysis of the competition between the traditional retailers and the Omni-channel retailers without considering the cost of establishing Omni-channel**

According to the Hotelling model, assuming that the demand of traditional retailers is  $D_a$ , and the demand of Omni-channel retailers is  $D_b$ , it can be concluded that the demand model of the two retailers is:

$$\begin{cases} D_a = \frac{k}{t} \\ D_b = 1 - \frac{k}{t} \end{cases}$$

Suppose the profit of the traditional retailer is  $\Pi_a$ , and the profit of the Omni-channel retailer is  $\Pi_b$ . In this case, the profit function of the two retailers can be obtained without considering the cost of establishing Omni-channel:

$$\begin{cases} \Pi_a = (p - c) \frac{k}{t} \\ \Pi_b = (p - c) \left(1 - \frac{k}{t}\right) \end{cases}$$

Proposition 4: in the condition of  $t < 2k$ , profit of the traditional retailer *A* is greater than the profit of Omni-channel retailer *B*.

Prove: in the condition of  $t < 2k$ , the consumer profit function can be obtained is  $\Pi_a > \Pi_b$ , profit of the traditional retailer *A* is greater than the profit of Omni-channel retailer *B*.

Proposition 5: in the condition of  $t > 2k$ , the profit of Omni-channel retailer *B* is greater than the profit of traditional retailer *A*.

Prove: in the condition of  $t > 2k$ , the consumer profit function can be obtained is  $\Pi_b > \Pi_a$ , profit of the Omni-channel retailer *B* is greater than the profit of traditional retailer *A*.

Proposition 6: in the condition of  $t = 2k$ , profit of the traditional retailer *A* is equal to the profit of Omni-channel retailer *B*.

Prove: in the condition of  $t = 2k$ , the consumer profit function can be obtained is  $\Pi_a = \Pi_b$ , the profit of traditional retailer *A* is equal to the profit of Omni-channel retailer *B*.

### **Analysis of the competition between the traditional retailers and the Omni-channel retailers considering the cost of establishing Omni-channel**

Similarly, according to the Hotelling model, it can be concluded that the demand model of the two retailers is:

$$\begin{cases} D_a = \frac{k}{t} \\ D_b = 1 - \frac{k}{t} \end{cases}$$

Because in the process of the traditional retailers transformation to Omni-channel retailers, some of the money need to spend to build different channels, such as online store and WeChat public number, assuming the cost to build different channels for Omni-channel retailers is  $s$  ( $s > 0$ ), the profit function of the two retailers can be obtained as follows:

$$\begin{cases} \Pi_a = (p - c) \frac{k}{t} \\ \Pi_b = (p - c) \left(1 - \frac{k}{t}\right) - s \end{cases}$$

Proposition 7: in the condition of  $t > 2k$ , if  $p < \frac{ts}{t - 2k} + c$ , the profit of traditional retailer *A* is

greater than the profit of Omni-channel retailer *B*. else  $p > \frac{ts}{t - 2k} + c$ , the profit of traditional retailer *B* is greater than the profit of Omni-channel retailer *A*.

Prove: in the condition of  $t > 2k$ , if  $p < \frac{ts}{t-2k} + c$ , the consumer profit function can be obtained is  $\Pi_a > \Pi_b$ , then the profit of traditional retailer  $A$  is greater than the profit of Omni-channel retailer  $B$ . Otherwise, the profit function is  $\Pi_b > \Pi_a$ , the profit of the Omni-channel retailer  $B$  is greater than that of the traditional retailer  $A$ .

Proposition 8: in the condition of  $t < 2k$ , if  $p > \frac{ts}{t-2k} + c$ , the profit of traditional retailer  $A$  is greater than the profit of Omni-channel retailer  $B$ . else  $p < \frac{ts}{t-2k} + c$ , the profit of retailer  $B$  is greater than that of the traditional retailer  $A$ .

Prove: in the condition of  $t < 2k$ , if  $p > \frac{ts}{t-2k} + c$ , the consumer profit function can be obtained is  $\Pi_a > \Pi_b$ , then the profit of traditional retailer  $A$  is greater than the profit of Omni-channel retailer  $B$ . Otherwise, the profit function can be obtained is  $\Pi_b > \Pi_a$ , the profit of the Omni-channel retailer  $B$  is greater than that of the traditional retailer  $A$ .

## Conclusions

According to the above analysis of competition model of traditional retailer and Omni-channel retailer, we can draw the following suggestions in Internet plus era for retailers:

(1) With the Internet and big data technology used widely, Omni-channel retailers gave consumers a seamless experience of multiple channels, in a shopping trip, consumers may use multiple channels, consumers may start from a channel and end with another channel. The Omni-channel can help consumers to reduce unnecessary traffic and time expenditure, greatly enriched the consumer shopping choices.

(2) From the utility model of traditional retailer and Omni-channel retailer we can come to conclusion that the critical point is  $\frac{k}{t}$ , when the distance between consumers and retailer is longer

than  $\frac{k}{t}$ , consumers are more willing to choose multiple shopping channels such as e-commerce and mobile terminals of Omni-channel retailer.

(3) In the model of the competition between the traditional retailer and the Omni-channel retailer without considering the cost of establishing Omni-channel, utility competition of traditional retailer and Omni-channel retailer is mainly related to the two variables: transportation cost  $t$  and distribution cost  $k$ , and there is no relationship with the sales price  $p$ . in the condition of  $t > 2k$ , profit of Omni-channel retailer  $B$  is greater than the profit of traditional retailer  $A$ , at this time, there

is a possibility for traditional retailer *A* to become Omni-channel retailer *B* in order to increase profits.

(4) In the model of the competition between the traditional retailer and the Omni-channel retailer considering the cost of establishing Omni-channel, utility competition of traditional retailers and Omni-channel retailer is mainly related to the three variables: cost of transportation  $t$  and distribution cost  $k$  and the sale price  $p$  of the commodity. In the condition of  $t > 2k$ , if

$p > \frac{ts}{t-2k} + c$ , the profit of Omni-channel retailer *B* is greater than the profit of traditional retailer

*A*. In the condition of  $t < 2k$ , if  $p < \frac{ts}{t-2k} + c$ , the profit of Omni-channel retailer *B* is greater

than the profit of traditional retailer *A*. In the above two cases, there is the possibility for traditional retailer *A* transforming to the Omni-channel retailer *B* in order to increase the profit.

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