The simulation of CPV model on net-work products at the simultaneous time

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Abstract

Simulated the state of market competition by using simulation software with considering the influence of the product’s compatibility and product’s CPV, providing reasonable suggestions for manufacturers.

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1. Introduction

The rapid development of information technology has accelerated the promotion and application of e-commerce, bringing precious opportunities to the pricing of network products. It’s been a new challenge for researchers to find a more rational price that can better reflect the needs of customers.

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2. Literature Review

Prabakar Kothandaraman, David t. Wilson ¹ had constructed a concept model for Value Net, considering that providing superior Customer Value is very important for network enterprises to create profits, which can be achieved by providing satisfactory products at reasonable price. We should evaluate the product value at the point of customer’s perspective². Customer Perceptive Value is a customer’s perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate (or block) achieving the customer’s goals and purposes in use situations³. The identification and evaluation of the driving factors for Customer-Perceived-Value helps us to find the crucial attributes which impact on customer purchase decisions⁴. And Conjoint Analysis can also be used in measuring product’s CPV which indicates the satisfaction degree of each product⁵.

In the research on pricing of network products, Anette ⁶ has constructed a pricing model for network products with considering network externality, drawing that network product’s value contains the intrinsic value and network value. Network product’s quality, profit and its price might be influenced by its network externality⁷. And a multi-episodic pricing model has been built and simulated by using the simulation software. Through simulating the state of market competition, it concluded that product compatibility, switching costs and network externality are critical factors for manufactures to make competitive strategies⁸.

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3. Pricing Model of Network Products

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3.1 Solution of the pricing model at the same time to enter the market

We can calculate the equilibrium price and output.

\[
\begin{align*}
P_{2A}^* &= \frac{3 + (a_1 + 2a_2)(k-1) + \Delta CPV + s(Q_{1A} - Q_{1B})}{3} \\
Q_{2A}^* &= \frac{3 + (a_1 + 2a_2)(k-1) + \Delta CPV + s(Q_{1A} - Q_{1B})}{3[2 + (a_1 + a_2)(k-1)]} \\
P_{2B}^* &= \frac{3 + (2a_1 + a_2)(k-1) - [\Delta CPV + s(Q_{1A} - Q_{1B})]}{3} \\
Q_{2B}^* &= \frac{3 + (2a_1 + a_2)(k-1) - [\Delta CPV + s(Q_{1A} - Q_{1B})]}{3[2 + (a_1 + a_2)(k-1)]}
\end{align*}
\] (1)
3.2 The pricing model of network products by entering the market successively

We can calculate the equilibrium price and output.

\[
\begin{align*}
P_A^* &= \frac{3 + (k - 1)(2a_2 + a_1) + s + \Delta \text{CPV}}{3} \\
P_B^* &= \frac{3 + (k - 1)(2a_1 + a_2) - s - \Delta \text{CPV}}{3} \\
Q_A^* &= \frac{3 + (k - 1)(a_1 + 2a_2) + s + \Delta \text{CPV}}{3[2 + (k - 1)(a_1 + a_2)]} \\
Q_B^* &= \frac{3 + (k - 1)(2a_1 + a_2) - s - \Delta \text{CPV}}{3[2 + (k - 1)(a_1 + a_2)]}
\end{align*}
\] (2)

4. Simulation Analysis of the Pricing Model of Network Products at the same time to enter the market

4.1. Compatibility at 0.75

Fig.1 The graph of the three-dimension at the point of \(k=0.75, a_1=0.1, a_2=0.3, \Delta \text{CPV}=0\)

4.2 Compatibility at 0.5

Fig. 2 The graph of the three-dimension at the point of \(k=0.5, a_1=0.1, a_2=0.3, \Delta \text{CPV}=0\)
4.3 Compatibility at 0.25

From above, we can learn that manufacturers' equilibrium profits are increasing by product compatibility. Because network clients can get more value from the network externality as product compatibility.

Deduction: If a product has the network externality, manufacturers can boost product compatibility to increase the value of their products. then it will earn more profit from attracting more people to buy it.

4.4 $\Delta CPV=-0.4$

4.5 $\Delta CPV=0$

Fig. 3 The graph of the three-dimension at the point of $k=0.25$, $a_1=0.1$, $a_2=0.3$, $\Delta CPV=0$

Fig. 4 The graph of the three-dimension at the point of $\Delta CPV=-0.4$ $k=0.5$, $a_1=0.1$, $a_2=0.3$

Fig. 5 The graph of the three-dimension at the point of $\Delta CPV=0$, $k=0.5$, $a_1=0.1$, $a_2=0.3$
4.6 $\Delta CPV = 0.4$

From above pictures and the table, we can learn that manufacture A equilibrium profits are increasing by product’s $\Delta CPV$. But manufacture B equilibrium profits are decreasing by products’ $\Delta CPV$. Network clients tend to purchase high-value products.

**Deduction**: Manufacturers may win the market by providing more good quality products than competitors through increasing its products perceived value. And take the advantages of network externality to lock more customers. So that it can win long-term competitiveness.

**References**


[4] Lin Bai. The Method Study on the Distinguishing and Judgments of Driving force on Custom Perceptive Value---As the Example of Mobile[D], Nanjing University of Aeronautics and Astronautics, 2007


