Simple Model for Considering Word of Mouth on Cultural Creative Goods

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ABSTRACT

Cultural creative goods usually have public goods characteristics and use non-market valuation techniques. Cultural value may contain elements that cannot be expressed by any quantitative or qualitative scale. When a consumer decides to purchase cultural creative goods, interpersonal influence and word of mouth (WOM) are the most important information sources. The main purpose of this study was to present a simple model for considering word of mouth (WOM) and characteristics of the products on the maximize profits for cultural creative goods.

Mathematical model developed for cultural creative goods were constructed. For the managers wanted to recommend their cultural creative goods to market, we give some suggestion about how to price. The model showed that in marketing cultural creative goods, when the market expands, its optimal price rises; and when the market matures, its optimal price falls.

Keywords: Cultural Creative Goods; Cultural Value; Word of Mouth; Mathematical Model

INTRODUCTION

Recently, the terms “cultural value” has been used to describe the value for a cultural creative good that represents the worth of the good when assessed in cultural terms. Cultural value may contain elements that cannot be expressed by any quantitative or qualitative scale. The characteristics of cultural creative goods might include their historic importance, their aesthetic properties, their uniqueness, and so on. Cultural creative goods usually have public goods characteristics and use non-market valuation techniques.

Cultural creative goods have their prices for those producing, consuming and making voluntary donations to support them. When a consumer decides to purchase cultural creative goods, interpersonal influence and word of mouth (WOM) are the most of important information sources. Gitelson and Crompton (1983) referred that WOM had been found to facilitate the sale of a wide range of products, including professional services, movies and travel. This influence may be especially important in the hospitality and tourism industry which intangible products are difficult to evaluate before consumption. Tourists’ restaurant selections were influenced by the WOM recommendations of opinion leaders, with few decisions based on the influences of formal media (Litvin, Blose & Laird, 2004). Visitors’ WOM recommendations boost wine sales when vacationing opinion leaders return home and tell others of their experiences (O’Neill, Palmer & Charters, 2002). Silverman (1997) also recognized the importance of WOM and the most powerful force in the marketplace.

The empirical literature on the determinants of the demand for cultural creative goods has emphasized its response to change in their price and income. Throsby (2003) had found that cultural
goods have low price elasticity. The income elasticity of demand is also low, meaning that demand displays a large degree of inertia (Heilbrun and Gray, 2001). Museums were located on the inelastic segment of demand curve. Inelastic goods and services will generate some excess burdens and the excess burden can be considered an additional cost to society beyond the amount of money collected by the museum (Darnell, 1998; Bailey & Falconer, 1998).

Garrow (2007) defined willingness to pay to travel by air or the additional demand that is stimulated to travel by air when air fares decrease. Borgonovi (2004) used logistic regression to show that many control variables do affect differently the frequency of participation. Besides, there were some researchers investigated how influence is willing to pay on the cultural creative goods and developed mathematical models from the standpoint of demand (Huang, Ting, & Chen, 2014). As Ting, Chen, & Huang (2010) focused on the optimal pricing strategies for travel products under considering consumer’s willing to pay and affordability.

In this study, we present a simple model for considering word of mouth (WOM) and characteristics of the products on the maximize profits for cultural creative goods. For the managers wanted to recommend their cultural creative goods to market, we give some suggestion about how to price. Our research serves not only contribute to the cultural economics literature, but also provides information to managers to market a new product.

The remainder of this paper was organized as follows. Literature reviews for considering word of mouth were presented in section 2. Simple mathematical model developed for cultural creative goods were presented in section 3. Cultural industry cases were discussed in section 4. The final section concludes.

**LITERATURE REVIEW**

Researchers have examined the conditions under which consumers are likely to rely on others’ opinions to make a purchase decision, the motivations for different people to spread the word about a product. Phelps et al., (2004) discussed consumer influence over other consumers has been demonstrated in concerning social and communication networks, opinion leadership, uses and gratifications, and diffusion of innovations.

Now, the research of WOM has developed in an Internet stage. That online conversation could offer an easy and cost effective way to measure word of mouth (Godes, & Mayzlin, 2004). Chevalier and Goolsbee (2003) studied the online book sales, with focus on internet-related questions rather than book market particularities. Both positive and negative reviews tend to increase sales (Sorensen, & Rasmussen, 2004). The potential of WOM was an effective tool for spreading the “visit Wales” message through the Welsh diaspora (Morgan, Pritchard & Pride, 2003). With the advancements of Internet technologies, increasing numbers of travelers are using the Internet to seek destination information and to conduct transactions online. The Internet has enabled new forms of communication platforms which have the ability to further empower both providers and consumers, allowing a vehicle for the sharing of information and opinions from Business to Consumer. Through Web-based consumer opinion platforms, the Internet enables consumers to share their opinions on, and experiences with, goods and services with a multitude of other consumers, that is, to engage in electronic Word-of-Mouth (eWOM) communication. Both a movie’s box office revenue and WOM valence significantly influence WOM volume (Wenjing, Bin & Andrew, 2008). Qiang et al. (2011) found that traveler reviews have a significant impact on online sales, with a 10 percent increase in traveler review ratings boosting online bookings by more than five percent.
MATHEMATICAL MODEL

Assume that the rate at which a new cultural creative product can be sold at any time \( t \) is \( f(p(t))g(Q(t)) \) where the unit price is \( p \) and \( Q \) is the accumulated sales. We assume \( f'(p)<0 \); sales vary inversely with price. Also \( g'(Q)>0 \) for \( Q<Q_1 \), \( g'(Q)<0 \) for \( Q>Q_1 \). For a given price, current sales grow with past sales in the beginning stages of product development cycle when people engage in WOM communication. When accumulative sales increase, there is a decline in the number of people who have not purchased the cultural creative product. Eventually, when the market becomes saturated, the sales rate for any given price falls. The unit production cost \( c \) may decline with cumulative sales if the firm learns how to produce less expensively with experience.

\[
\text{Max } \int_0^T [p - c(Q)]f(p)g(Q)dt
\]

s.t. \( Q' = f(p)g(Q), Q(0) = Q_0 > 0 \)

Price \( p \) is the control variable and accumulative sales \( Q \) are the state variable.

From the Hamiltonian

\[
H = f(p)g(Q)[p - c(Q) + \lambda]
\]

The optimal solution must satisfy (2) and following conditions.

\[
H_p = g(Q)[f'(p)(p - c(Q) + \lambda) + f(p)] = 0, \tag{4}
\]

\[
H_{pp} = g(Q)[f''(p)(p - c(Q) + \lambda) + 2f'(p)] \leq 0, \tag{5}
\]

\[
\lambda = -H_q = f(p)[g(Q)c(Q) - g(Q)(p - c(Q) + \lambda)], \tag{6}
\]

\[
\lambda(T) = 0 \tag{7}
\]

Using these conditions, we can characterize the solution qualitatively. Since \( g > 0 \), from (4) that

\[
\lambda = -f/f' - p + c \tag{8}
\]

Differentiating (8) with respect to \( t \), it would be

\[
\lambda' = -p'\frac{2 - f}{f'/f''} + cQ \tag{9}
\]

Substituting (8) into (5) and (6) derives

\[
gf'\left[2 - f''/f'\right] \leq 0 \tag{5}
\]

\[
\lambda' = f[g c' + g' f f'/f''] \tag{6}
\]

Using (2), equate (9) and (6)

\[
[2 - f''/f']p' = -g f''/f' \tag{10}
\]

Then, since \( f' < 0 \) and (5') holds, we conclude that

\[
\text{sign } p' = \text{sign } g' \tag{11}
\]

Equation (11) showed that in marketing cultural creative products, while the market expands \( (Q < Q_1) \), its optimal price rises, and when the market matures \( (Q > Q_1) \), its optimal price falls.

CULTURAL INDUSTRY CASES

Cultural creative goods such as music records, movies or books usually increase sales after publication and then decrease quickly. For example, the movie “Pretty Women”, before the opening weekend, it was expected to perform well, more than the average movie industry. In the opening weekend, it significantly exceeded expectations; movie sales were significantly above what the market was expected (Enrico, 2011). Because the effect of WOM or the look of Julia Roberts attracted to consumers,
total sales estimated about $23 million. Another example, “Just the Way You Are” is a song by American singer songwriter Bruno Mars. The song reached top of US Billboard Hot 100 on the chart dated October 2, 2010. By the end of December 2010, the song had sold over 3,280,000 digital copies in the US alone (Bruno Mars, 2010). The song spent a total of 48 weeks on the Billboard Hot 100. On August 2011 “Just the Way You Are” became the 108th million selling single in the UK, as of October 2011, UK sales stand over 1,032,000 copies.

In Taiwanese cinema, 2011 was a historical year; local film sales posted an astonishing 332% growth from the already impressive year of 2010, reported earnings of 50.8 million USD at the domestic box office. Taiwanese films in 2011 claimed back 17.5% of the total annual market share. In Taiwan, the most anticipated cinema of 2011 was Wei Te-Sheng’s big budget epic WARRIORS OF THE RAINBOW: SEEDIQ BALE. Costing 25million USD, it was the most expensive Taiwanese film to date (Wang, 2012). The film was described the Taiwanese aboriginal tribe’s uprising against the colonial Japanese forces in the 1930s, an event chronicled by historians as the Wushe incident. Despite the graphic violence and language barrier, the Taiwanese audiences proudly embraced SEEDIQ BALE as a must see national treasure. Owing to the effect of WOM, released in two parts with a total running time of 276 minutes, the epic grossed more than 27 million USD and win the best feature film prize at the 48th Golden Horse Awards, equivalent to the Oscars.

CONCLUSION

When a consumer decides to purchase cultural creative goods, interpersonal influence and word of mouth (WOM) are the most of important information sources. The main purpose of this study was to present a simple model for considering word of mouth and characteristics of the products on the maximize profits for cultural creative goods. Mathematical model developed for cultural creative goods were constructed. For the managers wanted to recommend their cultural creative goods to market, the model showed that in marketing cultural creative products, when the market expands, its optimal price rises; and when the market matures, its optimal price falls.

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