



Experiential goods with network externalities effects: An empirical study of online rating system

Jun Yang^{a,*}, Enping (Shirley) Mai^b

^a The School of Business Administration, University of Houston - Victoria, Victoria, TX 77901, United States

^b College of Business, East Carolina University, Greenville, NC 27858-4353, United States

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ABSTRACT

This paper uses online users' reviews and sales information from May 2003 to March 2007 to study a new experiential product: online video game (or virtual world). The results suggest that, first of all, for a hedonic product such as an online video game, the availability of online review system could not fully transform experience attributes into search attributes. The empirical study confirms that negative word-of-mouth has more significant impact than positive reviews. The study empirically verifies that the existence of direct network externalities (i.e. a product's value increases when more consumers join the network) is crucial for a hedonic product. The size of the user base signals the quality of the game, and works like a search attribute for potential users. A large user base will reduce the negative impact from unfavorable reviews.

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1. Introduction

The online video game industry, especially the massively multiplayer online role-playing games (hereafter MMOGs), is a rapid growing and profitable industry. One of the leading MMOGs, *Blizzard Entertainment's World of Warcraft*, had more than six million active users and generated \$1 billion subscription revenue in 2006 (Schiesel and Richtel, 2006). Because three platforms manufacturers, Sony, Microsoft and Nintendo, dominate the console gaming market, MMOGs become extremely important for game publishers. Electronic Arts Inc., one of the leading game publishers stated in its 2006 Annual Report, "Everything Online: The biggest change in our business today is the way mainstream consumers are using the Internet to purchase and play videogames.... Creating new online games and cultivating new customers is an important part of our growth strategy" (Electronic Arts Annual Report, 2006). To play an MMOG, a player usually needs to purchase an installation CD and pays a monthly subscription fee. He can register an account online, create an avatar, and build his avatar's power in the virtual world joined by millions of other players.

However, MMOGs have received only limited attention from the marketing researchers. Most existing literatures on virtual worlds are in the fields of Economics (Castronova, 2004) and Information Systems (Choi and Kim, 2004; Hsu and Lu, 2004). Unlike the traditional utilitarian products of which rational consumers try to maximize their

utilities, consumers play MMOGs for fun, leisure and enjoyment. MMOGs belong to the category of experiential goods or hedonic goods (hereafter we use these two terms interchangeably) (Dhar and Wertenbroch, 2000; Hirschman and Holbrook, 1982; Holbrook and Hirschman, 1982; Jones et al., 2006; Okada, 2005; Reddy et al., 1998).

Others' opinions are especially important for potential users of experiential products, because they provide indirect experience on sensory aspects and reduce the uncertainty associated with the products (Park and Lee, 2009; West and Broniarczyk, 1998). Literatures have suggested that the additional information provided by other users and third-parties could transform experience attributes into search attributes (Ford et al., 1990; Klein, 1998). The availability of online review systems for MMOGs provide an opportunity to address this question and study the word-of-mouth effect on search attributes and experience attributes.

Besides the hedonic nature, MMOGs also involve direct network externalities effect. Direct network externalities effect refers to the phenomenon that the value of a product increases with a larger installed base of users (Katz and Shapiro, 1985, 1986; Tirole, 1988). As more users join the same MMOG, its virtual world expands and generates more fun to all existing users. In this paper, we argue that the existence of direct network externalities is especially important for experiential goods such as online games. A large user base signals and guarantees the quality of the virtual world, thus reduces the perceived risk for potential users.

We collected individual user review information from *Gamespot.com*, a popular third-party website on all video games. This dataset contains very detailed information. For each review, the reviewer not only gives an overall rating for a specific game, but also evaluates some

* Corresponding author. Tel.: +1 361 570 4256; fax: +1 361 580 5599.
E-mail addresses: yangj@uhv.edu (J. Yang), maie@ecu.edu (E.(S.) Mai).

detailed attributes of the game, such as difficulty level, graphic, sound, etc. We further combined this review dataset with the games' installed base (i.e. subscription) data. Most existing literatures on experiential goods versus utilitarian goods use laboratory experiments approach (Chitturi et al., 2008; Dhar and Wertenbroch, 2000; Okada, 2005, etc). To the best of our knowledge, our paper is the first one to empirically test the different impacts on search attributes versus experience attributes of an experiential product by using real world data. Moreover, though direct network externalities effect has been well addressed in the Economics and Marketing literatures, our paper emphasizes its importance in consumers' evaluation of hedonic consumption.

The main contributions of this paper are threefold. First, the abundant information of online users' reviews has different impact on a hedonic product's search attributes, with respect to its experience attributes. The results show that the Internet could not completely transform experience attributes into search attributes. Second, our empirical results confirm the folk wisdom that negative word-of-mouth (hereafter NWOM) has a more significant impact on potential consumers than positive word-of-mouth (hereafter PWOM). Third, direct network externalities effect is especially important for experiential goods. A large installed base would reduce the negative impact from NWOM.

The remainder of the paper is organized as follows. We review the related literature and develop our hypotheses in Section 2. In Section 3, we describe our data collection procedure and discuss the methodology of empirical testing. We present our empirical results in Section 4, and conclude with contributions and limitations in Section 5.

2. Conceptual framework

2.1. Online video games: experiential products

The online video game industry provides a perfect context to study the hedonic consumption. In a virtual world created by millions of online users, a player can create any type of avatar as he desires, and accomplish all kinds of adventurous missions as he wants. Based on a study by the US-based Entertainment Software Association, the average age of a computer gamer is 33 (source: *Managing Intellectual Property*, Dec 2007/Jan 2008, p.1). Online game is no longer a symbol for teenagers. Market Research Company Nielsen Interactive Entertainment shows that young men play an average 12.5 h of video games every week (source: *Managing Intellectual Property*, Dec 2007/Jan 2008, p.1). Why do these adults spend lots of money and time to pursue the virtual fantasies? This phenomenon is very difficult to be justified by the traditional microeconomic approach, i.e. a rational consumer will allocate his resource to maximize his utility. Hedonic consumption proposed by Holbrook and Hirschman (1982) addresses this seemingly irrational behavior. Besides the more objective utilitarian attributes, a consumer also pursues some more subjective experiential perspectives (Hirschman and Holbrook, 1982; Holbrook and Hirschman, 1982), such as feelings, fun, sociability, etc. Usually a product is a combination of both utilitarian attributes and hedonic attributes (Dhar and Wertenbroch, 2000; Okada, 2005). Utilitarian attributes offer consumers functional benefits, and hedonic attributes give consumers experiential enjoyment (Batra and Ahtola, 1990; Hirschman and Holbrook, 1982; Jones et al., 2006). For online video games, the primary attributes are hedonic.

Like all other goods or services, experiential goods or hedonic goods can be placed on the continuum of search, experience, and credence attributes (Darby and Karni, 1973; Lovelock 1983; Nelson, 1970, 1974). The differences across these attributes are: (1) for search attributes, consumers can easily acquire their information and evaluate these attributes before purchase; (2) for experience attributes, consumers usually find them difficult to evaluate before consumption, but could do so during or after some consumption; and (3) for credence attributes, consumers cannot evaluate them even after usage (Darby and Karni, 1973; Hsieh et al., 2005; Klein, 1998; Nelson, 1970, 1974). Using

secondary online review data in this study, it is hard to differentiate experience attributes from credence attributes, which also depend on each individual's belief and skill level. We thus focus on the search attributes and the experience attributes. In the online game context we study here, search attributes include prices, and experience attributes include visual, acoustics and content designs. We differentiate the reviewers (existing users) from the readers (a combination of existing users and potential users), and study their different attitudes towards search attributes and experience attributes.

Hedonic consumption involves multi sensory, fantasy and emotive aspects of usage experience (Hirschman and Holbrook, 1982). For users, following the hedonic consumption framework,

H1a. For experiential goods: both search attributes and experience attributes are important for existing users.

Studies show that a consumer tends to rely more on others' recommendations and product experiences, when he considers an experience product than a search product (Bearden and Etzel 1982; Childers and Rao 1992; King and Balasubramanian 1994; Klein, 1998; Park and Lee, 2009; Senecal and Nantel, 2004; Weathers et al., 2007). The emergence of online review systems (such as amazon.com, imdb.com, Gamespot.com, epinions.com, just to name a few) provides existing users' reviews for readers to evaluate experiential goods (Chevalier and Mayzlin, 2006; Hu et al., 2007; Liu, 2006; Senecal and Nantel, 2004). The online review system becomes a new mechanism to offer additional information to potential consumers, just like other information mechanisms such as advertising, consumer report, critics review, etc. However, it is still debatable on how efficient this new mechanism could be to help users to evaluate search attributes and experience attributes. The Internet offers substantial information to consumers, thus the internet may change experience products into search goods (Klein, 1998). In a recent study by Park and Lee (2009), they find that the electronic word-of-mouth effect is greater for experience goods than for search goods.

Comparing to the traditional communication channels, the Internet reduces information asymmetry (Citrin et al., 2003; Grewal et al., 2003) and provides richer information (especially other users' firsthand experiences) for potential consumers (Gruen et al., 2006). The concern is whether these additional sources could efficiently convey the information on experience attributes to potential users. Many studies have found that it is difficult to convince consumers on experience attributes by using different communication approach. A study by Weathers et al. (2007) finds that the performance uncertainty was about the same level for experience goods, no matter whether the product information was provided by an independent third-party source or by the retailer. Some researches done in the Pre-Internet era to study the advertising claims confirm that consumers give more credibility to search than experience claims (Ford et al., 1990; Wright and Lynch, 1995). Comparing to search attributes, whose information can be easily obtained from secondhand sources, experience attributes need to be verified by firsthand subjective experience (Wright and Lynch, 1995). We argue that firsthand experience is crucial for hedonic (i.e. experiential) products. The availability of online review system does provide others' experiences for readers, but it could not fully transform experience attributes into search attributes. A consumer's consumption process of hedonic product is a dynamic interaction between the individual characteristics and the hedonic product (Eliashberg and Sawhney, 1994). Sen and Lerman (2007) study the online consumer reviews for hedonic and utilitarian products. They find that readers of negative hedonic product reviews tend to attribute the negative opinions towards the reviewer's internal (or non-product related) reasons. Though other users' reviews (word-of-mouth) are sometimes believed to be more credible (Banerjee, 1992; Bone 1995; West and Broniarczyk, 1998), we propose it would have different impact on search attributes with respect to experience attributes.

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