Value-informed Pricing for Virtual Digital Products: Evidence from Chinese MMORPG Industry

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Abstract: Value-informed pricing strategy, which focuses on determining the price level of products based on consumer value perception, is especially suitable to be applied in digital products rather than industrial ones. By carrying out 65 in-depth interviews with people involved in the Chinese Massively Multiplayer Online Role-Playing Game (MMORPG) industry, this paper explores the process through which a value-informed pricing strategy is applied to determine the price level of virtual in-game accessories - exploring pricing preference through interacting with games players, swaying pricing alternatives through managing the competitive environment and manipulating value perception through shaping the virtual marketplace. Further, this paper constructs a theoretical framework of value-informed pricing including the above process, and deciphers the linkage mechanism between different segments. The findings not only enrich the theory of value-informed pricing under the application context of virtual digital products, but also have implications for the practitioners in the MMORPG industry.

Keywords: value-informed pricing, virtual digital products, value perception, Resource-based View (RbV), Massively Multiplayer Online Role-Playing Game (MMORPG)

Introduction

Value-informed pricing, which is an emerging concept of pricing strategy that focuses on determining the appropriate price level through evaluating the consumers' value perception (a trade-off between what the consumer receives and what the consumer gives up to acquire the product) of its products, allows a firm to create a product advantage in the marketplace (Ingenbleek, 2007; Ingenbleek et al., 2010; Cressman, 2012). In order to set prices in line with the customer's perception of the product, value-informed pricing is highly recommended as the central pricing practice (Ingenbleek, 2014), rather than that product commoditization in industrial markets that tends to drive pricing towards cost- and competition-based (or market-based) logics (Töytäri et al., 2017; Dost & Geiger, 2017). However, as the above three types of pricing logics are identified and widely discussed by prior literature (Ingenbleek, 2007; Hinterhuber, 2008; Hinterhuber & Liozu, 2017), there is limited research by simultaneously taking two or three factors among the cost, competition, and value issues into consideration (Guerreiro & Amaral, 2018), although some scholars argued that the cost and competition are the basis of value-based pricing and there are always cognitive biases if we merely use the value perception to set the price (Füreder et al, 2014; Kienzler, 2018). This is an important gap in the extant literature, since the virtual digital products (rather than industrial products) that sprang up with our increasingly digital economy are urgently calling for a suitable pricing strategy

(Nagle & Müller, 2017), which supply an interesting context for the further exploration of value-informed pricing.

In prior literature on the pricing process (Monroe, 1990; Vogel et al., 2002; Dutta et al., 2003; Ingenbleek et al., 2003; Simon et al., 2003; Johansson, 2017), it is always discussed from a Resourced-based View (RbV) and regards pricing as a complex process that requires resources and coordination, and gradually gives more attention to individuals compared with the former organizational level focus (Töytäri et al., 2017). Although pricing policies, establishing reference value and customer value, value definition, value creation, value assessment and other issues are included in pricing (Anderson et al., 2010), what is the process? Are there any steps that set the price? What is the relationship between different steps? Such issues are far from being explored in depth, although a pricing process depending on value-based pricing efforts is difficult to implement due to the subjective, differing and unpredictable value perceptions used as the basis (Töytäri et al., 2015).

To fill this gap, this study seeks to explore the process through which a value-informed pricing strategy is applied to determine the price level of virtual digital products (virtual in-game accessories) by using the Chinese Massively Multiplayer Online Role-Playing Game (MMORPG) industry as the case. The reasons of case selection are as follows: firstly, MMORPG is one of the most commercially successful entertainment software applications which determines the price level of digital products (virtual in-game accessories) (Ang et al., 2007; Sourmelis et al., 2017); secondly, China has surpassed the USA and become the largest game market with a sale of 24.6 billion US dollars in 2016, and has a great potential for further growth (Roquilly, 2011; Rong et al., 2018). Thus, we believe that the pricing study on the Chinese MMORPG industry is of importance for the expansion of value-informed theory and can be generally referred by other countries to further develop this promising industry.

This paper is structured as follows: the second section will review literature on the MMORPG and the value-informed pricing from a theoretical perspective. This is followed by a description of the research methodology in the third section. The fourth section will investigate how a value-informed pricing strategy is applied in the MMORPG industry, and propose a theoretical framework to generalize the pricing process. The theoretical and practical contributions of this paper will be discussed in the concluding section, as well as an explanation of future research directions.

Literature review

MMORPG and virtual in-game accessories

A MMORPG is a graphical two-dimensional (2-D) or three-dimensional (3-D) game usually played by large groups of customers online, which allows individuals to interact with both gaming software and other players through their self-created digital characters or equipped "avatars" in a virtual game world (Steinkuehler & Williams, 2006). Many MMORPGs have associated online communities, making them not simply a platform for playing games but also a form of social activity for people to form relationships (Whang & Chang, 2004; Steinkuehler & Williams, 2006; Zhong, 2011; Wang et al., 2011; Yang et al., 2012; Peters et al. 2013).

MMORPGs are played over some form of computer network, from simple text-based games to those incorporating complex graphics and virtual worlds populated by many players simultaneously (Roquilly, 2011; Harwood & Ward, 2013). Players "train" their avatars through accomplishing various missions to earn experience points, power ups (leveling), and magic abilities, so as to help the avatars to advance in further stages/levels of the game (Sourmelis et al., 2017). During this repetitive, more difficult and challenging process, how to equip avatars to maximize their power plays a crucial role. Thus, a large portion of the revenue of MMORPG providers depends on their sales of virtual in-game accessories (e.g. weapons and food) rather than the purchase price of the title itself (Nojima, 2007), because virtual in-game accessories indicate different levels of skill and ability, and all of which may be carried over into subsequent gaming sessions (Wu et al. 2013). This is also why MMORPGs attract a huge amount of loyal users who are willing to pay money for virtual items when compared with other kinds of online games (Jin et al., 2017). Thus, the pricing strategy of such online games as MMORPG has significant differences when compared with traditional industrial products or even most typical digital products (e.g. software, music) (Ke et al., 2012).

There are two widely used charging methods (1) *time-based* model (customers purchase pre-paid cards to play for a fixed number of hours or for an unlimited amount of time within a specified number of days) and (2) *item-based* model (the game is free to play at the basic level but the virtual in-game accessories (items) are sold to enhance the strength of the avatars and thereby generate revenue for the MMORPG operators) (Roquilly, 2011; Rong et al., 2018; Castronova, 2006; Nardi & Harris, 2010). One emerging method is called *in-game advertising* model, in which revenue is generated from the embedded advertisements (Nelson et al., 2004). As the pricing of the *time-based* model is much simpler and more regular, and the *in-game advertising* model is not welcomed by many players, more and more MMORPG providers have adopted the *item-based* model as a substitute (e.g. Chinese customers favor the item-based pricing model more), which supplies an opportunity for MMORPG operators to manipulate the price, and this is also the focus on understanding the MMORPG providers' pricing strategy in this paper.

As a type of digital product, virtual in-game accessories enjoy unique features when compared with consumer or industrial products (Halbheer et.al 2014), such as costly to produce but cheap to reproduce, high sunk cost and low marginal cost, and no natural capacity limits for additional copies (Shapiro & Varian, 1999). At the same time, there are some specific characteristics for the virtual in-game accessories of MMORPG, for example, the virtual in-game accessories that players buy cannot be used repeatedly after buying, and the utility of virtual in-game accessories will no longer be attractive once they are equipped for decoration or to enhance the special abilities of avatars (Varian, 2000). Besides, MMORPG providers can maintain some degree of control over the frequency of consumption of virtual in-game accessories (Rong et al., 2018), such as how many times the virtual in-game accessories are used and further distributed in the game, as well as the virtual and real currency exchange rates are controlled by the game administrator (Lehdonvirta, 2009; Lehdonvirta & Kauppakorkeakoulu, 2009).

Taken together, although many scholars have identified MMORPG as a typical case and the pricing of traditional digital products is no longer a new area, the virtual in-game accessories of MMORPG still supply a specific context to study the method of value-informed pricing.

Value-informed pricing and pricing process capability

As value-informed pricing is linked to the expected benefits to the customer as a pricing reference, it represents a different logic of pricing compared to those that focus on a supplier's own costs of production, or market prices (Töytäri et al., 2017), and has the potential to be favorable to both the buyer and the supplier (Anderson et al., 2010). Value-informed pricing suggests that a firm should actively "seek" three kinds of information about how customers trade the perceived price off against the perceived attributes of the product (Kuester et.al. 2015), including (1) the level of price for a given product should be based on the "consumer's willingness to pay" in relation to his/her perceptions of value, (2) the level of price for a given product should be based on the competitors' pricing strategies, which set the reference price against which consumers will make comparisons (Ingenbleek & van der Lans, 2013), and (3) the "processing" information required to determine the price level and engaging in product innovation (Ingenbleek et al., 2010). For MMORPGs, experts suggest that the pricing strategy for virtual in-game accessories largely depends on the value that the consumers perceive because the value of virtual in-game accessories tends to vary widely depending on each consumer's playing motivation (Lehdonvirta, 2005a, 2005b; Nojima, 2007), and MMORPG providers can also use the information to adjust their product offers, which also influences the customers' perceived relative advantage compared with the price (Hamari & Lehdonvirta, 2010; Lehdonvirta, 2009). Thus, value-informed pricing is the result of the deployment of informational resources such as market research, relationships and internal knowledge of customers. Firms should not only develop these information sources, but also secure the process by which they are deployed. The latter is among others influenced by the competitive context and organizational information processing that may evolve into a routine (Ingenbleek, 2007; Nagle & Müller, 2017).

In the value-informed pricing literature, the RbV of the firm is widely used to provide an explanation of how a firm uses information resources to determine the product price level or adjust the product offering according to the price level, can create a product advantage in the marketplace (Ingenbleek et al., 2010; Liozu et al., 2012; Napier & Mishra, 2015; Dou & He, 2017), and has specifically recognized pricing as a resource under the RbV. For example, Dutta et al. (2003) found that pricing capabilities can be a source of competitive advantage, and noted that firms must invest to develop and maintain the necessary pricing management skills and processes. Chan et al. (2018) summarized four pricing strategies, named as perceived value pricing (based on the value perceived by the customer), penetration pricing (set a lower price at product introduction), skimming pricing (set a higher price when a unique product is first to market), and promotional pricing (offer a lower price for a limited time), to set the price based on product quality and consumer awareness. Liozu (2017) agrees with the view that value-based pricing is a science requiring capabilities proposed by Cressman (2010) and Hinterhuber & Liozu (2012), which relate to customer intimacy and what is critical in their daily operations, market segmentation, competitive analysis, and the ability to extract differentiation.

Likewise, the information about customers' value perception of virtual in-game accessories as valuable resources can yield a competitive advantage for MMORPG providers. Although many scholars state that pricing processes can be superior to cost cutting as a path to higher profitability and approve the importance for the pricing process to implement value-informed pricing (Simon et al., 2003; Liozu & Hinterhuber, 2012), research on the pricing process of MMORPG providers remains currently underdeveloped.

In summary, by reviewing the previous theories, it is clear that the method of value-informed pricing could be well adopted by virtual digital products; however, there is a lack of research on the pricing process of virtual digital products, especially in terms of the MMORPG industry. More studies are needed to address the following aspects and questions. First, what is the value-informed pricing process of virtual digital products and how does it work in the MMORPG practice? Second, what are the relationships between different process procedures and how do they guarantee the implementation of value-informed pricing?

Research methodology

This paper aims to recognize the pricing process and to build a pricing theory through applying a value-informed pricing strategy by using the Chinese MMORPGs as the case.

Case Selection

As discussed in the introductory section, there are two reasons for us to use this case. Firstly, China is the largest online gaming market in the world, and not only has a fast-growing market revenue (see Figure 1), but also represents more than one-fourth of global revenue in the sector, and the share is steadily rising in the most recent years (see Figure 2). Thus, the analysis of the Chinese case has an important reference value for foreign peers and the development of the global MMORPG industry. Secondly, China has the largest player group which favours the item-based charging model rather than the time-based model or the emerging in-game advertising model, when compared with American and European customers. With the item-based model the game is free to play at the basic level but the virtual in-game accessories (items) are sold to enhance the strength of the avatars and thereby generate revenue for the MMORPG operators, the Chinese MMORPG industry is an ideal case to explore the value-informed pricing process.
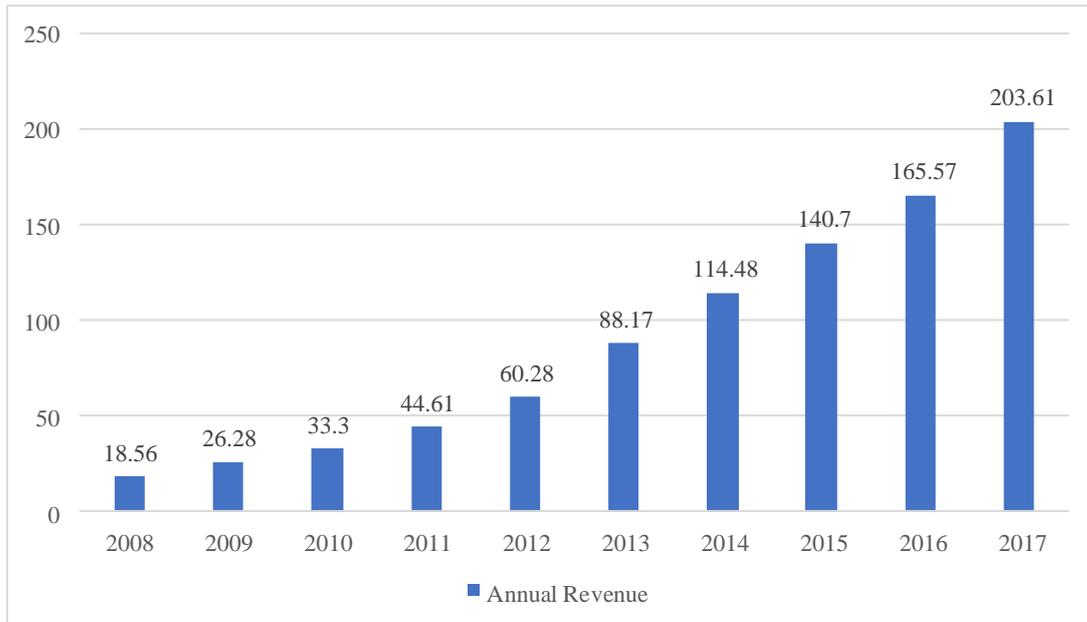
Figure 1 The Annual Revenue of Chinese Online Gaming Market (2008-2017)

Sourcing: http://www.chyxx.com/industry/201802/613340.html (Accessed July 2018); Unit: Billion Yuan (RMB)
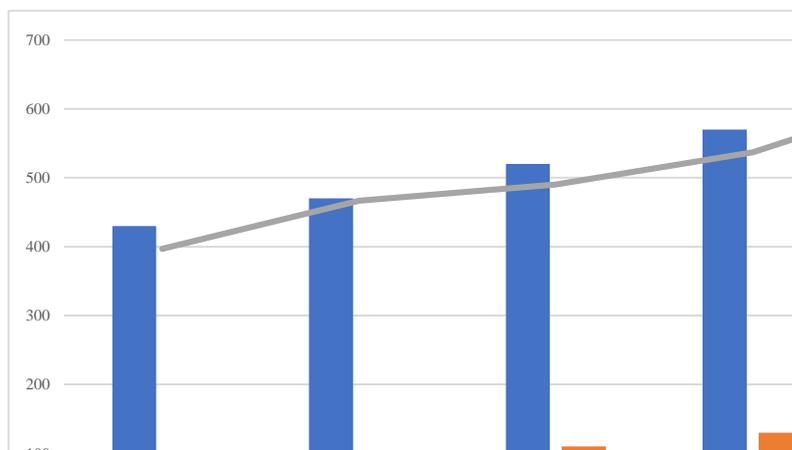
Figure 2 The Online Gaming Market of China and the World (2012-2016)

Sourcing: http://www.chyxx.com/industry/201802/613340.html (Accessed July 2018)

To answer the questions proposed in the introductory section, the inductive/qualitative approach was adopted, which is well suited to this kind of research (Easterby-Smith & Lowe, 2002), as stated by Strauss & Corbin (1998): "*qualitative methods can be used to explore substantive areas about which little is known or about which much is known to gain novel understandings [...], to obtain the intricate details about phenomena as feelings, thought processes, and emotions that are difficult to extract through more conventional methods.*"

Data collection

Regarding the qualitative nature of this research, we mainly employ interviewing, the most commonly used method to collect our data (Lewis, 2015). In general, there are three interview techniques differentiated by time and place, characterized as synchronous communication of time and place (e.g. face-

to-face interview), asynchronous communication of time and place (e.g. email interview), and synchronous communication of time while asynchronous communication of place (e.g. telephone interview, MSN messenger interview, Skype interview, Tencent QQ interview, WeChat interview.etc.) (Opdenakker, 2006). In order to overcome time and financial constraints, geographical dispersion, and physical mobility boundaries that adversely affect onsite interviews (Janghorban et al., 2014), we approached the interviewee online by adopting the synchronous semi-structured audio and video interviews, which is much easier to achieve than real-time response and direct interaction with interviewees compared with asynchronous pattern (Gaiser 2008). Due to the developments of computer technology and the usage habit of Chinese MMORPG professionals when we carried out our study from 2008 to 2014, we relied more on the techniques of Skype interviews and Tencent QQ interviews.

Regarding the whole process of the interviews, firstly, we contacted nearly 100 field professionals to express our interview request through the communication software of Skype or QQ with the help of the China Culture & Entertainment Industry Association (CCEA) and the China Game Industry Association (CGIA), and 65 experts accepted our invitations. Secondly, we sent a pre-interview e-mail with a formal introduction about our interview background and purpose, the use of data and confidentiality issues, and confirmed the interview time twice. Thirdly, we carried out our interview at the appointed time, reiterating the academic purpose of our interview and the confidentiality agreement before our formal talk started. This was followed by a structured conversation to discuss the interviewee's experience of using the pricing process, by following an interview guide covering four aspects which were pricing innovation, consumer preference, competition environment, and virtual marketplace (see Appendix). Fourthly, we invited the interviewee to discuss their views about the development trends of the whole industry, the industry policy and any other related issues. This was an opportunity which encouraged the professional to express what were their major concerns, including both positive and negative issues. During the whole interview process, we recorded on tape what the interviewee said having first obtained their permission. In addition, we made quick notes about the key points and novel ideas. The length of each interview with the MMORPG providers ranged from 25 minutes to over one hour. The sample distribution covered three groups, (1) 26 professionals from existing top Chinese MMORPG providers (occupying 40% share), (2) 25 professionals previous employed by dominant Chinese MMORPG providers (with 38% share), and (3) 14 professionals from joint MMORPG providers located in China, Korea or Japan (with 22% share). One more consideration was that, interviewees from large corporations were mainly made up of game design supervisors, product managers, marketing managers, operation managers or higher officials, while the counterparts from small firms were mainly senior managers. For example, the product manager in a small online game company always handles the pricing task for virtual products because the concept of product design and product price setting are closely interlinked from the initial MMORPG development to the MMORPG operation.

In addition to the interview data, we also searched related databases to obtain more general and overall statistics. Firstly, we comprehensively searched for policies and regulations relating to the online game industry, as issued by the Ministry of Cultural and Tourism (MCT) and the Ministry of Industry and

Information Technology (MIIT) of The People's Republic of China. Secondly, we searched for detailed information on the whole industry from the websites of the China Culture & Entertainment Industry Association (CCEA) and the China Game Industry Association (CGIA), as well as top MMORPG providers such as Tencent, NetEase, The9, Giant, and Perfect World. Thirdly, we traced their activities through searches on their corporate websites and related reports on TV, in newspapers and on other websites, and also considered speeches presented by certain leaders and senior experts in this area.

Data analysis

We employed the grounded theory, the most popular approach to date for building theories to carry out our following qualitative analysis (Decrop & Masset, 2018). We followed six steps to analyse the data collected within this research. Firstly, all the collected data, including interview transcripts, direct notes, news reports, policies, annual industry reports, published consulting reports and companies' internal documents, were systematically reviewed and cross-checked. Secondly, we adopted a hybrid coding approach advocated by Silverman (2015) and Creswell & Creswell (2017), so as to assimilate both structured and open-ended interview data. For example, we put all the information obtained using our interview guide together, so as to lay the foundation for analysis for pricing perception to aggregate into the first order categories as "collecting customer information", and this was complemented by the interviewee's forecasting comments on his/her customers, as well as the meaning, causes and consequences of pricing capability from our data for Chinese MMORPG providers. Thirdly, we transferred the first-order categories into second-order categories by refining the core components, which were customer investigation, customer monitoring, customer interaction via social ventures, competitive environment exploitation, competitive environment exploration, virtual marketplace establishment, virtual marketplace maneuvring, and virtual marketplace supervision. Fourthly, the first-order and second-order categories were further clustered into the theoretical construct of three categories (exploring pricing preferences through interacting with customers, swaying pricing alternatives through managing the competitive environment, and manipulating value perception through shaping the virtual marketplace). Fifthly, we identified the linkages between the different pricing steps, so as to further conceptualise a process framework for the value-informed pricing strategy. Finally, we integrated previous analyses and obtained this paper's theoretical and practical contributions. Following this logic, we adopted the comprehensive coding process illustrated in Figure 3, demonstrating the pricing process which we developed from our data analysis.
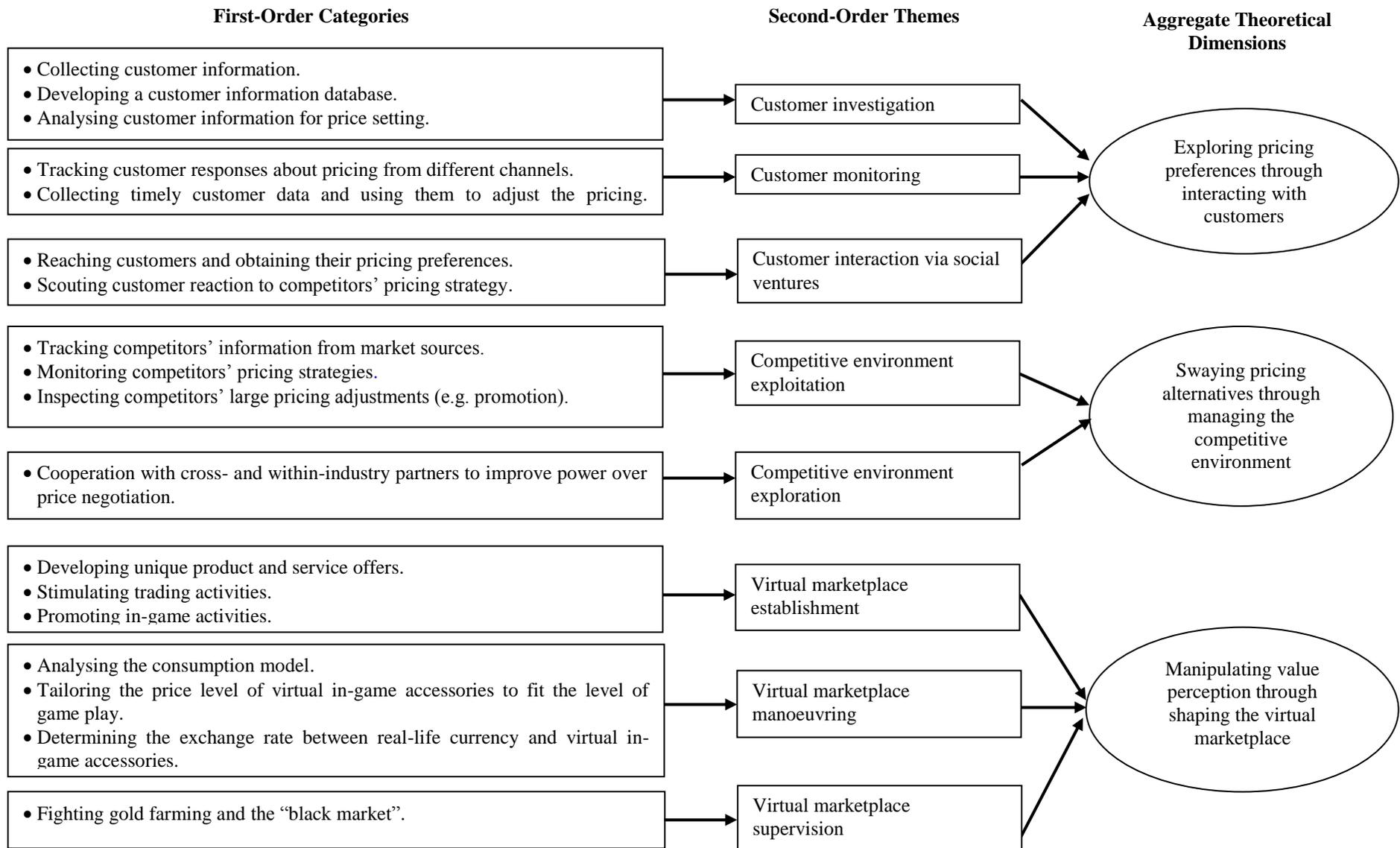
First-Order Categories	Second-Order Themes	Aggregate Theoretical Dimensions
• Collecting customer information. • Developing a customer information database. • Analysing customer information for price setting.	Customer investigation	Exploring pricing preferences through interacting with customers
• Tracking customer responses about pricing from different channels. • Collecting timely customer data and using them to adjust the pricing.	Customer monitoring	
• Reaching customers and obtaining their pricing preferences. • Scouting customer reaction to competitors' pricing strategy.	Customer interaction via social ventures	
• Tracking competitors' information from market sources. • Monitoring competitors' pricing strategies. • Inspecting competitors' large pricing adjustments (e.g. promotion).	Competitive environment exploitation	Swaying pricing alternatives through managing the competitive environment
• Cooperation with cross- and within-industry partners to improve power over price negotiation.	Competitive environment exploration	
• Developing unique product and service offers. • Stimulating trading activities. • Promoting in-game activities.	Virtual marketplace establishment	Manipulating value perception through shaping the virtual marketplace
• Analysing the consumption model. • Tailoring the price level of virtual in-game accessories to fit the level of game play. • Determining the exchange rate between real-life currency and virtual in-game accessories.	Virtual marketplace manoeuvring	
• Fighting gold farming and the "black market".	Virtual marketplace supervision	

Figure 3. Data Structure

Findings and analysis

Exploring pricing preferences through interacting with customers

The first step of the value-informed pricing process is to explore pricing preferences through interacting with customers, which involves three sets of activities: customer investigation, customer monitoring and customer interaction via social ventures.

(1) Customer investigation

Customer investigation concerns the generation of market intelligence about potential customers and comes down to understanding customers' value preferences. MMORPG providers use three major routes to investigate customers' price preferences.

➤ The first is through beta testing, which allows MMORPG providers further to modify and improve their game products and track and update customer information by analyzing and identifying consumer groups, balancing and localizing the game, and this will appeal to the customers' taste and also establish the consumer base by creating a "buzz" in the customer community (Dolan & Matthews, 1993).

➤ The second is through collaborating with distribution channels. Using the data provided by distribution channels, MMORPG providers can analyze their customers' data and gain a better understanding of any changes in their purchase behavior and trends.

➤ The third is based on the records of customers' past purchases. As the data platform established from the computer system records each transaction, these data are a good reference when setting the price.

(2) Customer monitoring

Customer monitoring is concerned with continuously tracking their price preferences as well as the price strategies of their competitors, which enables MMORPG providers to make better price decisions in the future. After the initial stages of investigation into their customers' price preferences, MMORPG providers continuously collect customer data about their games and use this information to make further pricing strategy adjustments. By continually tracking and updating their customer data, MMORPG providers can determine the optimal price level for their in-game accessories.

(3) Customer interaction

The third way to explore customer value preferences is through interacting with them via social venues, especially internet cafés. Although an internet cafe is neither a footloose space nor entirely locally embedded, such space is configured in the intersection between trans-local images and local circumstances (Lægran & Stewart, 2003). According to the responses of our interviewees, internet cafés serve as an important medium for reaching customers and tracking their information and value preferences regarding virtual in-game accessories. MMORPG providers consider that internet cafés are critical partners helping them to scout the movements of their customers and the competition, which acts as the main online game distribution channel used by the Chinese online game companies (Ren & Hardwick, 2011).

Swaying pricing alternatives through managing the competitive environment

The second step is swaying pricing alternatives through managing the competitive environment, which involves two activities: competitive environment exploitation and competitive environment exploration.

(1) Competitive environment exploitation

In this research, the term 'competitive environment exploitation' refers to the activities involved when an individual MMORPG provider attempts to study its direct competitors (i.e. other MMORPG providers) for the purpose of refining its current pricing strategy. In order to understand its competitors' price strategies, a MMORPG provider will first collect its competitors' information from market sources, analyze it and then determine its price strategies through two types of price movements.

➢ The first is more permanent and often caused by a shift in the competitors' overall price strategies. In order to respond properly, MMORPG providers must conduct a detailed cause analysis of the price strategy shift.

"The active information of our rivals needs to be updated and delivered to different departments in a timely way. It is critical for us in adjusting our marketing or distribution or changing our pricing." (XG, Game developer)

➢ The second type of price movement is more temporary and often triggered by their competitors' promotion tactics.

"We have been keeping a close eye on our rivals' various promotional activities, and study how they organize game players' meetings in internet cafés, activities held in their player clubs, and how they run their promotional activities." (CJ, COO)

(2) Competitive environment exploration

Competitive environment exploration focuses on discovering new ways to influence customer value perception by reducing the possibilities of customers engaging in price comparisons (Ingenbleek & van der Lans, 2013), and MMORPG providers play an active role in increasing their bargaining power on price through collaborating with others.

Rather than having companies in the value chain that compete against each other, successful businesses will be the ones that can find ways to combine and establish common strengths (Turner, 2002), either cross-industry or within-industry collaborations.

➢ In terms of cross-industry cooperation, the following interviewee revealed a variety of ways in which MMORPG providers can join forces with their partners to expand their market share.

"We jointly launched an advertising campaign with xxx in thousands of supermarkets in 23 provinces in China in late 2007. We promoted their sales; in return, xxx's coffee products contain top-up cards for our game." (FC, Marketing manager)

➢ In comparison, within-sector cooperation (especially through a merger or acquisition) aims to increase their overall control of their customer base.

"A couple of years ago, the success of other companies told us that acquisitions could be a way to beat rivals. It could bring not only fresh R&D capability but expand the game player base as well. We keep an eye on competitors' M&A activities and make corresponding responses. At the same time, given the money we have in hand, we keep on seeking appropriate targets."(ZM, Marketing manager)

Manipulating value perception through shaping the virtual marketplace

The virtual marketplace refers to an emergent marketplace existing in a MMORPG world where customers can purchase, exchange or redeem in-game accessories using real world or virtual world currency

(Lehdonvirta, 2005a, 2005b). In comparison to other types of digital product (e.g. music), whereby each individual can benefit from the purchase of one copy and may use it indefinitely (Varian, 2000), MMOPRG providers have greater control over the expiration, distribution and pricing of in-game accessories, which we refer to as manipulating value perception through shaping the virtual marketplace, and consists of the following activities.

(1) Virtual marketplace establishment

➢ Developing unique product and service offers

To establish a virtual marketplace, MMORPG providers often develop unique product and service offerings associated with proper price offers. Certain techniques, such as in-game accessories degradation and vanishing, are widely used by many game designers. For example, the functions of a virtual weapon in a game will decline if it is broken during combat, which causes game players to pay for its repair or buy more effective and expensive virtual goods after vanishing. A game player is always required to place his/her in-game accessories into an inventory with limited space, and must keep buying inventories to store various virtual in-game accessories due to the space limitation and different types of item. In addition, a service offering is delivered mainly through game masters to convince customers about the value of the MMORPG's products and services, and MMORPG providers always employ a large number of game masters to do this.

➢ Stimulating trading activities

To improve their marketplace function, MMORPG providers often stimulate the trading of in-game accessories by generating buying incentives. For example, customers will be motivated to purchase virtual items to keep up with their peers. The incentive of peer pressure stimulates trading activities between the Chinese MMORPG providers and their customers and allows the former to establish a virtual marketplace.

➢ Promoting in-game activities

These trading activities can also be stimulated by promoting attractive in-game activities.

"When organizing activities, we try our best to maintain a balance between the purchasers paying and the rewards they get. We will try to keep non-paying players playing our game by encouraging them to fight monsters and complete special tasks, and set rewards for players who purchase items. These rewards can be bonuses or pieces of armor, or they can be convenience rewards, such as a personal vendor or a mobile mailbox." (CN, Technical director)

(2) Virtual marketplace maneuvering

Once the virtual marketplace has been established, MMOPRG providers can proceed to maneuver it to maximize their returns.

➢ Analyzing the consumption model

In order to set competitive prices for virtual in-game accessories, an appropriate pricing mechanism refers to the price determination system (Spann et al., 2004) that is especially needed by MMORPG providers. By understanding the consumption model, MMORPG providers can gain a clearer idea about when customers will be most likely to purchase specific in-game accessories and their willingness to pay (Ingenbleek & van der Lans, 2013).

"We identify the important variables and then create a model for how they all fit together, so as to find out how long players will spend on the game, how quickly they'll learn the rules, when

they'll invite their friends to play, and when and how many players will plan to pay, as well as how much." (CH, COO)

➤ Tailoring the price level

We also found that MMORPG providers attempt to tailor the price of virtual in-game accessories to fit the game level, as suggested by the following interviewee.

"We identify, track and record how quickly players reach a new level. The leveling up speed / control is the major parameter for virtual goods pricing. In practice, game players will level up quickly at the initial stage, and will then extend the level-up period through our game design. The slowing of progress will make many game players impatient and inspire them to spend real money to progress faster." (MD, Technical director)

➤ Determining the exchange rate

In order to encourage customers to purchase additional in-game accessories required to advance to the next level, MMORPG providers need to carefully assess the level of game play and the type and number of virtual in-game accessories that customers are required to purchase, and also set an appropriate price level to maximize the economic gain for themselves while not discouraging their customers by demanding too much purchasing from them. To retain loyal customers and attract new ones, many games involve different activities to reward their game players. Normally, a game provider wishes to issue certain types of "loyalty reward" or a so-called "VIP starter Bundle", an additional bonus for players who remain in the game for the early operation period, and a discount for virtual goods.

(3) Virtual marketplace supervision

To ensure the fairness of the prices paid by honest customers, MMORPG providers need to combat price cheating. Similarly, a typical "black market" activity involves a seller who plays MMORPGs excessively to acquire virtual items, and then sell them at discounted prices for real world currency to buyers who would otherwise pay more to acquire them through MMORPG providers or the official trading platform (Lin & Sun, 2007).
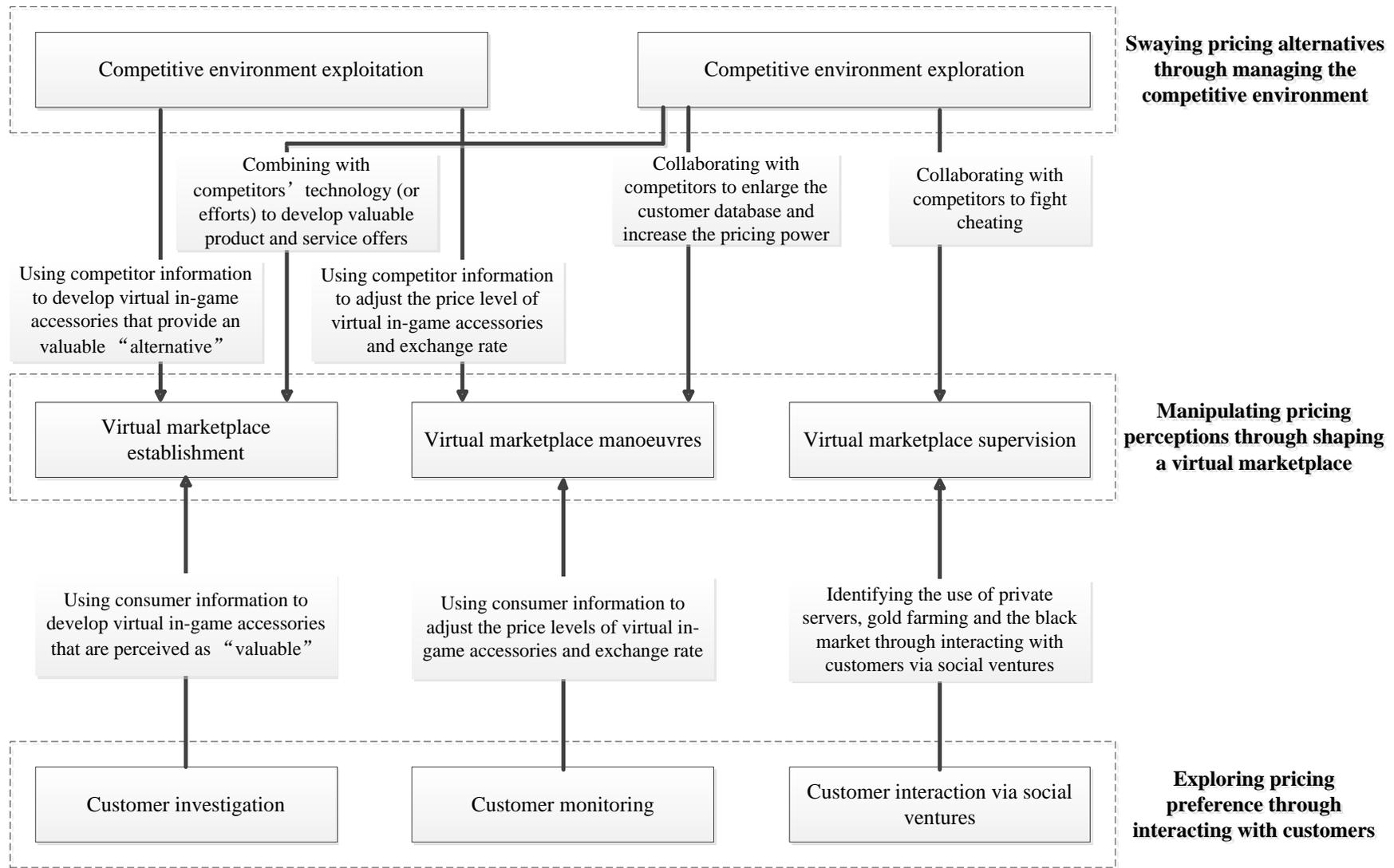
Figure 4. Value Informed Pricing Framework

A grounded model of value-informed pricing for MMORPG providers

By assimilating the themes of these three dimensions, we develop a process framework that suggests the relationship among them (see Figure 4).

 (1) Linkages between exploring pricing preferences and manipulating value perceptions

For this issue, we find that an understanding of customer value perception enables MMORPG providers to design better virtual marketplaces that fit the needs of their customers. In particular, through engaging in customer investigations and customer interactions via social ventures, MMORPG providers are able to collect and use customer information to develop virtual in-game accessories that their customers perceive as valuable.

Based on the game players' segmentation and differentiation as well as consumption habits, the game designers in the product development team are responsible for using game mechanics to create a need corresponding to virtual in-game accessories and motivate game players to pay willingly for them. Furthermore, through customer investigation, monitoring and interaction via social ventures, MMORPG providers can develop a thorough understanding of their customers' value perceptions and adjust the price level of virtual in-game accessories and exchange rate accordingly. We find that MMORPG providers normally seek to increase their customers' willingness to purchase virtual in-game accessories, although each game has its own unique game content. Besides, MMORPG providers can identify the use of gold farming (the production of MMORPG virtual currencies, items, and services for financial gain) and "black market" through interacting with customers in social ventures (Heeks, 2009).

The interviewees' responses imply that MMORPG providers' interactions with their customers via social ventures (particularly internet cafés) can enhance their ability to supervise the virtual marketplace. We expect that better supervision of the virtual marketplace would allow MMORPG providers to retain their existing customers if they perceive fairness when playing online games.

(2) Linkages between swaying pricing alternatives and manipulating value perceptions

For this issue, we find that an understanding of how consumers react to the competitors' offering equips MMORPG providers with a basis for making appropriate pricing decisions. In particular, our data suggest that MMORPG providers attempt to use competitor information to develop virtual in-game accessories that provide a better alternative product offering for their competitors' customers. A similar approach is also adopted toward using competitor information to adjust the price level of virtual in-game accessories and the exchange rate. These allow MMOPRG providers to acquire more knowledge about the product and price preferences of game users and their competitors' offers, so as to make pricing decisions accordingly. This is in line with experts' suggestions that value-informed pricing is not only focused on studying a firm's own customers, but also requires a thorough understanding of its competitors' offers (Ingenbleek et al., 2010; Liozu et al., 2012).

Through collaborating with internal and external industry partners, MMORPG providers can become more effective by creating joint promotion packages to create buying incentives and cooperate in supervising the virtual marketplace. Specifically, our data suggest that, by combining their own with their competitors' technology (or efforts), MMORPG providers can develop product and service offers that the

customers perceive as valuable. Further, through collaboration with their competitors, MMORPG providers can improve their virtual marketplace manoeuvres through enlarging their customer database and increasing their pricing power.

The central concept of value-informed pricing is based on understanding what the customers perceive to be valuable in a firm's product offer, which determines their willingness to pay (Hinterhuber, 2004; Ingenbleek et al., 2010; Füreder et al, 2014; Kienzler, 2018). While Ingenbleek (2007) held the view that part of the value perception was formed by making comparisons with the alternatives, we suggest that the alternatives not only refer to the competitors' offering, but also to the lower cost of in-game accessories that customers can find on the "black market". This is because, when customers take the competitors' offering, they need to switch to a different game that is offered by the competition, but when they purchase in-game accessories on the "black market", they can play the same game at a lower cost. Perhaps cheating is more damaging to customers' value perceptions than competitive product offerings from the perspective of the host MMORPG providers. Through collaborating with their competitors, MMORPG providers can increase their ability to obtain more information about the cheating that may be taking place, so as to improve their customers' value perception.

Discussion and conclusion

This study aims to understand how the value-informed pricing strategy is applied in the MMORPG industry. Accordingly, our process framework for this strategy and the supportive findings advance pricing research. In particular, we contribute to the value-informed pricing literature that previously focused only on the pricing practices related to consumer or industrial products (e.g. Hinterhuber, 2004; Ingenbleek et al., 2010) by providing an in-depth description of how providers generate their pricing strategies based on consumers' perceived value of virtual digital products. Specifically, our study shows that MMORPG providers' ability to understand their consumers' value perception and competitors' pricing strategies still plays a critical role in determining their pricing strategy. This paper also points out that the concept of value-informed pricing has gone beyond a mere competence in setting the optimal price for in-game accessories according to the customers' value perception, but involves a new cluster of pricing activities through managing the competitive environment and virtual marketplace by MMORPG providers. This is an important distinction between this study and prior work on the value-informed pricing strategy, because it implies that, by comparing with consumer products or industrial companies, MMORPG providers may have greater power to influence their customers' value perceptions about in-game accessories once they have registered for a game, and the cost and competition factors should also be taken into consideration even when adopting a value-informed pricing. This is a further improvement based on the view that there are always cognitive biases if we merely use the value perception to set the price (Füreder et al, 2014; Kienzler, 2018).

In addition to expanding the elements when applying a more comprehensive value-informed pricing practice, this study also contributes to the ongoing stream of literature that examines how a firm may implement its value-informed pricing process. Prior research has identified pricing policies, establishing reference value and customer value, value definition, value creation, value assessment and other issues as

the essentialities of pricing (Anderson et al., 2010; Töytäri et al., 2015), yet has not outlined a clearer process to carry out the pricing. This study proposes a grounded model to carry out the value-informed pricing through three phases of exploring pricing preference through interacting with games players, swaying pricing alternatives through managing the competitive environment and manipulating value perception through shaping the virtual marketplace, and investigates the linkage mechanism between different segments.

Thirdly, this research contributes to the body of work that seeks to understand the pricing strategy from the RbV (Dutta et al., 2003). Our grounded, comprehensive process framework presents a view of how MMORPG providers use their customer and competitor information resources accordingly to manipulate their customers' value perception of in-game accessories available in the virtual marketplace. Thus, for MMORPG providers, the value-informed pricing strategy is about their ability to use information resources not only to determine the appropriate price level for reaching and sustaining customers but also to create incentives that encourage customers to participate in the virtual marketplace, as well as offer necessary marketplace supervision. In this sense, MMORPG providers need to possess the ability to monitor and regulate the prices in the virtual marketplace in a similar way to central bankers or governments in the financial marketplace.

We recognize that our study suffers due to several limitations. Firstly, the choice of the qualitative research method may constitute a research limitation. It allows us to build the theory about the existing relationships among the variables, but not to measure the strength of these relationships. Our research does not produce any quantitative weight measurements for each pricing capability construct. The second limitation concerns the quality of the data. The use of online audio and video interviews would be problematic if the interviewees do not have access to a high-speed, stable broadband internet connection. Delays or blockages in broadband internet traffic would weaken the quality of the online audio-video interview, and might also affect an interviewee's willingness to continue with the interview. Finally, the generalizability of current findings may be regarded as a limitation of this research, which focuses solely on the Chinese MMORPG industry. Although this focus allows us to gain some in-depth knowledge about the value-informed pricing strategy for MMORPG providers, it may also hinder our ability to draw broader conclusions about the entire worldwide MMORPG industry. Future researchers might adopt the same research method and expand the study to include other countries.

Appendix: Interview Guide

Pricing Innovation:

- How did the company decide whether and when to introduce pricing innovations?
- How did your company try to take advantage of the pricing innovations?
- How did your market share dominance influence your decision regarding pricing innovation?
- How do you evaluate the importance of pricing innovation in the development of the Chinese online game industry?

Consumer Preference:

- In your experience, what kind of customer demands are the most difficult to meet?
- How did you ensure that the current game-players can all be maintained after adopting the new pricing strategies for your existing games?
- What is your company's strength over your competitors in satisfying customer demands?
- What kinds of tool do you apply to collect game-players' transaction data?

Competition Environment:

- How did your pricing innovation affect the decisions of your competitors?
- Which factors do you think will be more important when deciding on a company's market share competition?
- Confronting the severe market share competition, to which aspects do you plan to devote more resources, game development or service efficiency?
- How do you plan to explore your financial potential in the market share competition?

Virtual Marketplace:

- How do you analyse a game player's virtual-good purchase data?
- What are your primary promotion strategies in the virtual marketplace? How helpful are they with regard to consumers' value perception?
- How do you evaluate your current virtual product menu and do you have any plan to enrich your product set in the near future?

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