

Virtual item sales as a revenue model: identifying attributes that drive purchase decisions

Vili Lehdonvirta

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Abstract The global market for virtual items, characters and currencies was estimated to exceed 2.1 Billion USD in 2007. Selling virtual goods for real money is an increasingly common revenue model not only for online games and virtual worlds, but for social networking sites and other mainstream online services as well. What drives consumer spending on virtual items is an increasingly relevant question, but little research has been devoted to the topic so far. Previous literature suggests that demand for virtual items is based on the items' ability to confer gameplay advantages on one hand, and on the items' decorative value on the other hand. In this paper, I adopt a perspective from the sociology of consumption and analyse examples from 14 virtual asset platforms to suggest a more detailed set of item attributes that drive virtual item purchase decisions, consisting of functional, hedonic and social attributes.

Keywords Consumer behaviour · Online communities · Business model · Purchase drivers · Virtual consumption · RMT

1 Introduction

Virtual goods are understood to refer to objects such as characters, items, currencies and tokens that exist inside various online games and hangouts. Selling virtual goods has arguably become a major new source of revenues for consumer online services, complementing the existing palette of advertising, usage fees, sales of customer data and miscellaneous value-added services (see e.g. [13]). The global volume of real-money trade of virtual goods was estimated at 2.1 billion USD per year in 2007 [20]. To provide context, online advertising revenues in 2006 in the U.S. were approximately 16.9 billion USD [27]. The purpose of this paper is to outline the basics of

V. Lehdonvirta (✉)
Helsinki Institute for Information Technology, PL 9800, 02015 TKK, Finland
e-mail: vili.lehdonvirta@hiit.fi

virtual goods-based business and examine the question of why people spend money on virtual goods.

Real-money trade of virtual goods first emerged in 1999 as player-to-player trade in massively multiplayer online role-playing games ('MMORPG'). Users would list their hard-earned game possessions on eBay and let other users bid for them [18]. In recent years, the growth of the market has increasingly been driven by game operators selling goods directly to their players. This is particularly true in the East Asian market. In September 2005, 32% of titles surveyed by Nojima [25] in Japan used virtual item sales as their main revenue model. In October 2006, the share had grown to 60%. Besides games, another type of service that frequently utilises the revenue model are so-called "virtual worlds", simulated spaces where users spend time socialising, creating and shopping for virtual goods. Latest-generation connected video game consoles are also experimenting with the model.

In addition to games, virtual goods are also increasingly being sold in mainstream online services. Finnish online image gallery *IRC-Galleria*, Korean social networking site *Cyworld*, Chinese instant messaging service *Tencent QQ* and U.S. social networking site *Facebook* are examples of extremely popular online services that earn revenues by selling virtual goods to their users. Common objects are priced at a dollar or less, while notable objects can be sold for tens of dollars. In 2006, it was reported that *Cyworld's* virtual item sales amounted to nearly 300 000 USD per day, or approximately 7 USD per user per year [30]. At the same time, advertising-heavy *MySpace* made an estimated 2.17 USD per user per year [30]. This suggests that virtual item sales may in some cases be able to rival advertising as the primary revenue model for mainstream online services, which represents a major shift in consumer online business.

Due to the novelty of the revenue model, designing virtual goods is still an undisciplined pursuit. Service operators put considerable effort into overall design and marketing, identifying the tastes of their target consumer and positioning their service favourably among competing offerings. But when it comes to designing the virtual goods inside the service that ultimately generate the revenues, similar rigour is rarely applied. Virtual commodity design is driven by artists and concept designers, while the marketing department, which in theory has the analytical tools and customer insight necessary to maximise customer value, is rarely involved.

One common approach to product design in marketing is to attempt to identify which product attributes influence consumers' purchase decisions. For example, in some industries and product categories such attributes could be size, shape, performance and style [15, p. 376]. These "purchase drivers" can then be used to guide prototyping and follow-up research. In this paper, I take an analogous approach to virtual consumption, attempting to identify attributes and features of virtual goods that influence consumers' interest in purchasing them. The advantage of this approach is that the results can be quite readily translated into practice, since they describe concrete product attributes. A shortcoming of the approach is that not all consumer behaviour can be explained in terms of individual preferences for attributes. Social, economic and contextual factors also play an important part.

The following section contains a survey of previous research on virtual goods and a brief theoretical review of what kinds of uses consumption researchers identify for

goods in general. Sections three and four form the empirical part of this paper, where I analyse existing online games, “virtual worlds” and other online hangouts to identify cases where users’ choices of virtual goods are influenced by particular attributes that can be linked back to the theory. In the final part, I assess the findings, compare them with previous research, and discuss their applications in design and follow-up research.

2 Background

2.1 Defining virtual goods

Defining exactly what is meant by virtual goods has been a challenge during the short history of research relating to the concept. Many authors (e.g., Oh and Ryu [26]) define virtual goods only implicitly through the services they examine (i.e. “virtual goods are goods that exist in a virtual world”). A more general definition of virtual goods risks including other e-commerce transactions such as MP3 files from *iTunes*, which intuition suggests belong to a different category. To prevent this, it is tempting to add a qualifier requiring that virtual goods are “simulations” of material objects. However, there are many virtual goods that do not have any “material” counterpart. Even those that have an intuitive counterpart (e.g. clothes) can have uses and attributes that are completely different from the material object. Thus, it is more accurate to see virtual goods as a new independent category of goods: goods that are sometimes “inspired” by certain commonplace objects, but not “virtual versions” of them.

The problem of definition was most successfully solved by Fairfield [9], who succinctly captured the main difference between virtual goods and information goods such as MP3 files: virtual goods are *rivalrous*, meaning that one person’s making use of a virtual good excludes others from simultaneously doing so. In this one aspect, all virtual goods simulate material objects. For example, a shirt can only be worn by one person at a time. Information, in contrast, is not rivalrous: one person can give an MP3 file to another person and keep it at the same time, too.¹ Other features pointed out by Fairfield are *persistency* and *interconnectedness*. Persistency refers to the idea that an object must exist for some length of time for it to be considered an asset. Items that disappear when the computer is turned off are not worth much. Interconnectedness means that the object must not exist in isolation: other users or systems must be affected by it somehow. Objects that appear on one’s personal computer only are not virtual goods.

This definition is technology agnostic and applies to everything from *Cyworld*’s virtual furniture to *World of Warcraft* gold coins. It indicates that they have a common role as rivalrous resources in a digital environment where few other resources are rivalrous. From a sociological point of view, it could be speculated that in the user’s

¹ Except of course that copyright law demands that users treat non-rivalrous information goods as rivalrous objects that are traded like commodities. Digital Rights/Restrictions Management (DRM) systems go further by enforcing this rivalrousness through technical means, turning information goods into virtual goods.

Fig. 1 Comparing information goods, virtual goods and material goods



perception, virtual assets are transformed from mere media representations into objects of a “thing-like” nature in a process that resembles theories of objectification and reification [24, p. 13]. As a result, the user may begin to apply mental models associated with commodity consumption instead of mental models associated with media consumption. This is a significant difference from a business point of view, similar to that between selling photographs of *Gucci* bags and selling the actual *Gucci* bags. Figure 1 illustrates these differences.

Fairfield’s definition of virtual assets actually includes all kinds of rivalrous online resources, such as websites and Internet domain names, which are similarly rivalrous by design (one name can only be held by one legal person at a time). While domain names are also bought and sold on online marketplaces, they differ from virtual furniture and gold coins in that copies of desirable names cannot be mass produced for retail; they are naturally scarce. In this paper, I use the term virtual goods to refer to the subset of virtual assets that can be mass-produced and as a result are frequently bought and sold like conventional consumer commodities. In practice, this mainly includes the items, characters and currencies of massively multiplayer games and other online hangouts. For the most part, this paper focuses on the items. Even when virtual currencies are sold for real money, the ultimate object of consumption is usually the items.

What the end user perceives as a virtual good is always part of a user experience delivered by an information system. The software code that produces the item experience does not necessarily have to have any “thing-like” qualities in itself, but if a single entity must be pointed out as the physical manifestation of a virtual good, it is typically a row in a database. These systems, which can be anything from a massively-multiplayer online game like *World of Warcraft* to a social networking site like *Cyworld*, may also simulate some features of an economy, such as markets and production. The resulting system is sometimes called a “virtual economy” [18]. These can be further divided into closed economies and open economies, and their various properties are another interesting avenue of research. However, the basic principles of virtual commodities (rivalrousness, persistency, interconnectedness) remain the same from system to system. Further study of the internal dynamics of these systems is outside the scope of this paper, but is occasionally touched upon in the discussions below.

Having arrived at a reasonable definition of what virtual goods are and what they are not, in the following section, I proceed to review previous research relating to the sales of virtual goods for real money.

2.2 Previous research on virtual goods

I attempt to maintain a comprehensive bibliography of scholarly publications related to real-money trade of virtual assets, available at [33]. Out of the approximately 80 works currently listed, the majority focus on the fascinating legal and philosophical questions that virtual worlds and virtual assets give rise to (e.g., Fairfield [9], Lastowka and Hunter [16]). Only a handful deal with virtual goods as a revenue model from a business perspective: Nojima [25], Oh and Ryu [26], Lehdonvirta [18] and Guo and Barnes [12]. One market research institute has published a summary of the findings of a survey of purchase habits in *Second Life* [29]. Elsewhere in the literature of electronic commerce, the terms “virtual asset”, “virtual commodity” and “virtual consumption” usually refer to unrelated concepts such as simulation. In contrast to the scarcity of research on virtual asset sales, more traditional revenue models such as online advertising and online sales of conventional goods and services have been widely researched [14, 17, 21].

Nojima [25] focuses on virtual item sales as a revenue model for massively-multiplayer online games, comparing it with subscription fees and selling packaged software. She points out that item-based pricing comes close to price discrimination, where each user pays according to their value experienced as opposed to paying a fixed rate. In theory, this boosts revenues by enabling the seller to harvest what would otherwise be consumer surplus. Using surveys, Nojima examines relationships between the revenue models and players’ motivations for play. The motivations are based on a model by Yee [34]. Nojima finds that players who buy items report higher levels of immersion in a game. One explanation offered is that it takes a certain amount of immersion before virtual objects begin to feel desirable enough to purchase.

Using a similar approach as Nojima [25], Lehdonvirta [19] examines different motivations an individual may have for purchasing virtual goods for real money. Users’ attitudes towards real-money trading and virtual asset purchases are seen as being linked with their general motivations for participating in the virtual world and the activities they engage in. Motivations that are discussed most prominently are advancement in a status hierarchy, advantage in competitive settings, keeping up with co-players, experiencing new content, customisation and self-expression.

Guo and Barnes [12] assume a more deterministic psychometric approach, attempting to develop a preliminary model of “individual determinants for the decision to purchase virtual items within virtual game communities” [12, p. 70]. The model is largely based on older models intended to describe user acceptance of new technologies in management and information systems sciences. Thus, the determinants it identifies include ease of use, “performance expectancy” and “perceived enjoyment” [12, p. 72]. The only social determinant is “the degree to which an individual perceives that important others believe he or she should use community transaction mechanisms to gain high-level virtual items for enhancing character competence” [12, p. 72]. The resulting model offers a rather mechanistic view of user motivations, which furthermore makes assumptions regarding the mechanics of the underlying service that seem to confine its application to certain MMORPGs only.

The studies introduced above place the user in the center of attention, examining motivations and decision processes that lead into virtual asset purchases. In contrast,

Oh and Ryu's [26] case study of two Korean online games, *Kart Rider* and *Special Force*, focuses on game content and how virtual items contained in the games are programmed to function. Based on their observations, they offer the following advice for game developers:

- Balance between items that can be purchased with real money and items that must be earned through gameplay, and build synergies between the two categories.
- Allow players to keep “ornamental” items permanently, but make “functional” items consumable.
- In the case of items that give the player a performance advantage, do not disclose the exact numbers; provide approximate descriptive texts instead.
- Introduce items linked to specific events and communities (e.g. Christmas decorations and guild emblems).

The analysis is grounded in observations but lacks ties to any existing body of knowledge that would allow theoretical insights to be made. Some general structures can be seen underlying the advice—a division into “ornamental” items versus “functional” items, and the value of linking items to other entities—that could be developed further. This might also allow the advice to be applied in a more general context of online services as opposed to online games only. In the following section, I tap into established consumption research to obtain more ideas on what aspects of virtual goods consumers might be attracted to.

2.3 Uses of goods in sociological literature

Another approach to understanding consumer behaviour in relation to virtual goods is to consider how the question has been answered in the context of traditional material goods. In sociological and cultural studies of consumption, three basic perspectives can be identified on the uses of goods: functional aspects of goods, emotional aspects of goods, and the use of goods as markers for drawing social distinctions [10, p. 85]. The functional or utilitarian attributes of goods are those that allow them to be used as instruments towards fulfilling some higher objective, usually a tangible material objective that is seen as related to some fundamental human need. In Marxist theory, this is called the use-value [24]. In marketing terms, it might be expressed as features and performance [15, p. 377]. While functional attributes may be perceived as the basic reason why goods are valued, they are clearly not the only reason, especially in contemporary consumer societies.

Contemporary sociologists such as Campbell [4, 5] and Featherstone [10] have drawn attention to the individual emotional aspects of consumption. Campbell sees consumption as a hedonistic process of pleasure seeking, while Featherstone [10] discusses the aesthetic and even artistic aspects of contemporary consumer culture. Consumers seek pleasurable sensations and mix fashions and consumption styles in a way that resembles artistic expression. From this perspective, the visual, aesthetic and pleasure inducing attributes of goods are brought into attention. Indeed, attributes such as form, shape, taste, color and style are important considerations in traditional product design [15, p. 376].

Finally, a large part of the sociology of consumption deals with the use of goods in building social bonds or distinctions. Generally speaking, consumers are seen as

communicators who use symbolic meanings embedded in commodities to express status, class, group membership, difference or self-identity (e.g. [3, 23, 31]). The satisfaction derived from goods is primarily linked to their use as markers, and only secondarily related to their physical consumption [8]. For example, a classic study by Veblen [32] describes a situation where those who belong to the highest social class seek to distinguish themselves from the lower classes through conspicuous consumption. The consumed goods can be functionally inferior as long as they are exclusive and thus capable of drawing distinctions. Another example is the accumulation of collectible objects, which can be completely ‘useless’ and non-functional [1, 2], but also somewhat uncommon or otherwise distinctive enough (e.g., due to their special provenance) to make their pursuit sufficiently challenging; this allows status hierarchies to form between collectors. In contemporary consumer culture, brand names, popular bands and other pop culture icons are used in a similar way to draw social distinctions and express self-identity [28].

It can be argued that symbolic content is not really an intrinsic attribute of the goods, but rather a feature of the surrounding social reality. On the other hand, such goods will necessarily have some tangible distinguishing feature that makes it possible to pin down the symbolic content on a specific good, making it suitable for use as a social marker. The aesthetic aspects of goods can be analysed both in terms of individual emotional pleasure as well as in terms of the symbolic content the aesthetics may point to.

The three-pronged approach outlined above can be seen as an extension of Oh and Ryu’s [26] dichotomous notion of “functional” versus “ornamental” items. According to this approach, the “ornamental” attributes of goods can be further divided into hedonic and social attributes, while functional attributes can co-exist in the same items.

3 Objective and method

The empirical part of this paper is an exploratory study of what attributes consumers are influenced by when purchasing virtual goods. What kinds of differences are there between virtual goods that lead consumers to choose one good over another? Previous literature on virtual goods has mostly focused on the performance dimension, while also recognising that goods may have some vaguely defined “ornamental” uses. Literature from the sociology of consumption suggests that goods can be seen as having three kinds of attributes: functional, emotional and social. The precise attributes vary from one type of good to another, but common attributes used in marketing include performance, features, color and style. The objective of this study is to identify similar attributes for virtual goods. The attributes must be general enough to potentially apply to virtual goods broadly, but tangible enough to be useful in design.

The method is an analysis of existing massively multiplayer online games, “virtual worlds” and other online hangouts that contain virtual goods to identify instances of users’ choices being apparently influenced by a particular observable attribute of a virtual good. The analysis is structured into functional, hedonic and social attributes as suggested by the literature, although there is overlap. The titles included in the

Table 1 Virtual goods platforms included in the study

Title	Publisher/operator
<i>Aapeli.com</i>	Apaja, Finland
<i>Cyworld</i>	SK Communications, Korea
<i>EVE Online</i>	CCP Games, Iceland
<i>Facebook</i>	Facebook, U.S.
<i>Habbo Hotel</i>	Sulake, Finland
<i>IRC-Galleria</i>	Sulake, Finland
<i>Jippii.com</i>	Jippii, Finland
<i>Kart Rider</i>	Nexon, Korea
<i>MapleStory</i>	Nexon, Korea
<i>Second Life</i>	Linden Research, U.S.
<i>Snow War</i>	Sulake, Finland
<i>Special Force</i>	Nexon, Korea
<i>Ultima Online</i>	Electronic Arts, U.S.
<i>World of Warcraft</i>	Blizzard, U.S.

study are listed in Table 1. The analysis is based on first-hand use experience (except for *Snow War* and *Special Force*), interviews with developers (*Aapeli.com*, *EVE Online*, *Habbo Hotel*, *IRC-Galleria*, *Jippii.com*, and *Snow War*), interviews with professional virtual goods traders ($N = 2$), previous literature (cited as appropriate), and numerous informal discussions with users and players, both computer-mediated and face-to-face. The data was collected between early 2005 and late 2007, and for the most part not specifically for this paper, but as general background material for virtual consumption related research. The cases described in this paper were selected for their variety, clarity and availability of information with regard to the purposes of this study. This kind of information-oriented sampling, as opposed to random sampling, is appropriate for exploratory studies and situations where depth of information is valued over breadth [11]. Statistical generalisations are not possible from these cases, but quantitative follow-up studies can use the results as a basis for formulating hypotheses.

Of the titles covered, *EVE Online* and *World of Warcraft* do not actually use the virtual goods sales revenue model in any form. They are nevertheless a valid source of observations for the purposes of this study, because their users still have to make decisions on how to allocate scarce resources between various goods, and those decisions are arguably based partly on the attributes of the goods regardless of whether real money is used as a medium or not. In any case, the virtual currencies of most if not all massively multiplayer online games can be converted to real money on secondary markets.

The results are presented in the following section. The presentation style is a rather “thick narrative form” [11, p. 237] that can be useful from a designer’s point of view, since it preserves some of the ambiguity inherent in the phenomenon. The results are summarised at the end of the section in a tabulated form.

4 Virtual item purchase drivers

4.1 Functional attributes

In MMORPGs such as *Ultima Online* and *World of Warcraft*, the most visible driver of real-money trading is performance; in whatever way it may be understood in the context of the rules of the game. Powerful characters are more valuable than less powerful ones, sharp swords are more valuable than blunt ones, and fast steeds more desirable than slow ones. Performance is a positional attribute: if everyone has high performance, no one has high performance.

However, game operators who have attempted to monetise by selling performance advantages for real money have met with mixed success. In 2000, Sulake launched a competitive “casual” online game called *Snow War* in Finland. Later, a revenue model was added where users could buy bigger snowballs and thicker coats by sending premium SMS messages. The prospect of being able to win by spending more money on the service than others was not welcomed by the players. In 2001, the whole game was dropped, although for a variety of reasons. In 2002, the Finnish branch of casual gaming site *Jippii.com* experimented with a single player action game where users could purchase bigger bombs to perform better in the game and increase their scores against rivals. This was considered as a potential revenue model for various games, but it was dropped after the bombs failed to sell. In 2004, Electronic Arts announced plans to begin selling advanced characters in the MMORPG *Ultima Online* for real money, probably inspired by the widespread eBay trading of powerful characters for significant sums of money (500–2000 USD). Player response was negative. When the “Advanced Character Service” was launched, it actually sold only mediocre avatars, not powerful ones [18].

At the same time, several Korean online games successfully sell performance-based items to users. For example, in *Kart Rider*, players can purchase faster vehicles and items that improve their chances of winning by hindering other players. *Kart Rider* utilises a two-currency model, where lesser items can be bought with real money, while the most powerful items can only be bought with points earned through gameplay. This limits how much influence purchases can have on game performance and works towards ensuring that player skill remains an important determinant of success. One point also worth noting is that the gaming culture in Korea is generally much more saturated with real-money purchases than Western markets. Attitudes also vary between user segments [19].

In addition to providing a simple performance advantage (e.g. “5% faster”, “10 points more damage”), items can provide new functions, convenience or gameplay options to the player. For example, in the Korean online first-person shooter game *Special Force*, players can use real money to purchase items that make it possible to record a replay of a match or change the appearance of the crosshair to be more visible from the background [26]. In *MapleStory*, players can purchase a pet that does not take part in fighting, but saves the player trouble afterwards by helping to pick up items left by the defeated monsters. In both cases, the idea is that actual performance upgrades generally have to be earned through gameplay instead of cash purchases, but cash purchases can help to reach these gameplay goals faster. This helps to preserve the prestige associated with hard-to-get powerful items.

Items that provide new functionalities are very similar to small value-added services that are sold in some online games and services. Indeed, many functionalities could conceivably be sold as either attached to an item or as a separate subscription service. The difference is that when attached to an item, the functionality can possibly be re-sold to another player.

While performance advantages and new functionalities no doubt have a strong influence on users' purchase decisions, there are many apparently highly desirable virtual items that lack both of these attributes. In such cases, the items' desirability can perhaps be traced to some type of emotional or social attributes that they contain.

4.2 Hedonic attributes

In online hangouts like *Habbo Hotel*, users commonly point to the aesthetic qualities of goods to explain their consumption choices. One *Habbo* user explained their choice of virtual clothes as follows:

Regarding my current style, the reason I wear those colors is that the yellow hoodie is close to my favorite color, which is golden yellow. White goes with all clothes, that's why the bottom is white. Hair also yellow, same reason as the hoodie. IRL [in real life] I don't like to wear shorts and a hoodie at the same time, but in Habbo it somehow pleases my eye.

Aesthetic attributes can also be important in competitive environments where consumption related discussions center around performance. In *World of Warcraft*, players can buy effects known as "enchants" to improve the performance of their weapons. "Minor Beastslayer" delivers a very modest performance improvement, but is nevertheless among the most popular enchants in its price range. The reason is that it imbues weapons with a red glow. "It's not useful, but it's cool," said one player about the enchant. A player maintained site at *GlowChart.com* helps *World of Warcraft* players choose glowing enchants based on their hue and intensity.

The aesthetic attributes of virtual goods include their on-screen representations as well as any animations and sounds associated with them. The name or label of a good and any related background fiction or narrative presented to the user may also form part of the aesthetics. If the aesthetic aspects of virtual goods are sufficiently compelling, users may derive hedonistic pleasure from experiencing them. What exactly are compelling aesthetics is a question outside the scope of this paper, but the answer will depend on the target audience. However, aesthetically pleasing features may be difficult to distinguish empirically from features that are desirable because of their social value. For example, is the "Minor Beastslayer" desirable because of its aesthetic appeal, or because it is fairly visible and sufficiently uncommon (at one time) to generate social distinctions?

Another kind of hedonistic sensation may be derived from suggestive and pornographic items and avatars available in *Second Life*. The goods generate visual and aural stimulation comparable to an interactive porn movie. However, a general difference between virtual items and objects appearing in a movie is that while both can generate hedonistic sensations, virtual items can also simultaneously have a social role.

4.3 Social attributes

Besides giving rise to individualistic hedonistic pleasure, the visual appearance of goods can also be seen as related to their social value. In *Habbo Hotel*, users can be seen describing each others' appearances and possessions using terms such as "fashionable", "stylish" or "smart". What is currently "stylish" is a matter of much debate, indicating that it is a social convention rather than some objective state of aesthetic quality.

From the designer's point of view, the difficulty is that "stylish" is something that is very hard to design. Some designers are able to consistently come out with products that audiences perceive as stylish (consider *Apple*), but there is no formula or recipe that automatically results in stylish design. Style can be considered a positional attribute: if everything is cool, then nothing is cool. From this point of view, only by differing from the rest do glowing swords have the chance of being perceived as "cool".

One possible way to seek stylish virtual good design is to allow users to generate content. *IRC-Galleria* lets users create their own virtual items by uploading an image and selecting a simple behaviour from a list. Items created in this way can be placed on a moderated marketplace to be sold to others. The vast majority of the items attract very few purchases, but a few become very successful. No figures have been released by the operator, but according to one informant, Managing Director of the company operating *IRC-Galleria* in January 2007, total item sales increased very significantly after the user-created items were introduced. Having only operator-designed content could perhaps be likened to having a city full of people wearing the same brand of clothes: consistent but potentially dull. User-created content introduces diversity but also conflicting visions.

In other cases, the visual appearance of a virtual item does not seem to be connected with its desirability as a commodity at all. In *Ultima Online*, one of the most highly valued virtual items in the whole system was a small brown lump named "horse dung". Despite its very modest appearance and complete lack of performance or functionality, people have paid the equivalent of hundreds of U.S. dollars for the item. The reason is that in *Ultima Online*, horse dung is extremely rare. Upon the creation of each instance of the game world, the developers placed a handful of manure in some stables, presumably to enhance the atmosphere. But as virtual horses produce no discharges, no more of the substance was ever created. Players quickly noticed this fact and grabbed the unique cakes as souvenirs.

One informant, owner of virtual item dealership *UOTreasures.com*, estimated that at best there existed one piece of horse dung for 30 000 players. According to the informant, "owning one of these was a status symbol, akin to owning a diamond in the real world." The lucky few who owned a piece would proudly display it at a prominent spot in their house or castle for others to admire. In 2007, *Ultima Online* was more than ten years old and had fewer than 100 000 players left, but the informant claimed he was still able to sell some of the extremely rare items with prices "in the \$300 range each". In a similar example from *Habbo Hotel* Finland, a limited number of non-functional virtual record players were distributed in 2002 as part of an advertising campaign. In 2006, users were bartering them for around 250 "Plastyk chairs" (a type of item), which equals a re-purchase cost of approximately 290 USD.

Not surprisingly, many operators manufacture rarity (also known as “artificial scarcity” [6]) to increase the value of the assets they are selling. In *Habbo Hotel*, seasonal items such as Christmas trees are available in the catalog only at specific times of the year. “Collectibles” are available only for a limited period of time after their introduction, usually for two weeks but sometimes for only two hours. In *Facebook*, many of the items users purchase as gifts to other users are made available in a limited quantity. Usually the stock is several hundred thousand, but the rarest item only exists in five copies.

4.3.1 Individual differences

Even if a given item is not particularly rare, its provenance can differentiate it from all other similar items and thereby increase its ability to create social distinctions. Provenance includes things such as the item’s age, previous owners, notable situations it has been involved in, and how it was originally created or acquired. For example, in *Habbo Hotel*, a decorative trophy that was originally given to a well-known “celebrity” user (and has that user’s handle inscribed on it) is valued many times higher than a visually identical new trophy with no such history.

In many cases, game and service developers do not provide users with features that would allow them to discern historical information about their goods, lessening the value of the goods. Sometimes users come up with workarounds: in order to keep track of how old a user-created room is, a *Habbo Hotel* user might place a virtual pet in it. The user interface provides no way of checking when a room was created, but it does show the age of the pet inside it. Older rooms exist in fewer numbers and are considered more prestigious.

Another method of differentiating a given virtual asset from others of the same type is customisation or personalisation: allowing users to modify attributes of the asset according to their preferences. For example, in many games and services the user is able to pick a name and color for their virtual pet. Completely user-designed objects are an extreme form of customisation. Besides differentiating, customisation can also strengthen the emotional bond the user has with the asset. To what extent customisability is a social attribute rather than an individualistic emotional attribute is a matter of debate.

Some games allow user groups to put their own logo or badge on an item. In *World of Warcraft*, players can design and purchase a guild tabard, while in *EVE Online*, alliances will in the future be able to paint their logos on spaceship hulls. The obvious purpose of these group-customised items is to act as symbols of membership. In games and services that do not support membership badges, some user groups have nevertheless chosen some relatively uncommon item as a symbol of their membership and require every member to wear it.

4.3.2 References to outside culture

In most of the above examples, the symbolic value of a virtual good stems from its role and meaning inside the game or service. A person not part of that social world would probably not see the good as valuable at all. It is also possible to make virtual

assets attractive by importing and attaching meanings to them from the other social worlds: the surrounding popular culture. For example, during the *2006 FIFA World Cup*, the international football (soccer) championship tournament, *IRC-Galleria* sold virtual football kits in each team's colors. According to the Managing Director of the company operating the service, for a period before and during the games, the sales of these kits surpassed the sales of all other virtual items. Users showed allegiance to their favourite teams by buying and displaying the kit, thus creating social bonds and distinctions (on soccer fandom and digital spaces, see also [7]).

IRC-Galleria also offers various items that incorporate the name, logo or likeness of a popular artist, band or upcoming movie. They are released as part of advertising campaigns and are paid for by advertisers, but many users find them highly desirable. Fans of a given artist or movie collect the associated virtual merchandise in a way comparable to how traditional fans seek official T-shirts and figurines. Indeed, Finnish casual gaming site *Aapeli.com* (the international version of which is *Playray.com*) has announced a deal with Sony BMG to sell virtual artist T-shirts [22]. The lineup includes clothes branded with stars from a popular television show called *Idols*. In a similar fashion, *Cyworld* sells decorative items shaped after famous characters from popular anime series and online games.

Virtual commodities branded with pop culture icons can serve multiple purposes, from providing aesthetic pleasure to establishing membership in a fandom and communicating identity and values to others. Given that the icon is what matters, why do users not simply copy the graphics from these items and paste them onto their profile for free? Items in *IRC-Galleria* are two-dimensional and have very little functionality, so for most practical purposes copy-pasting would produce "items" very similar to the "real" thing. One reason why users nevertheless choose the originals is probably convenience, but it may also be a question of *authenticity*. A true fan of a given team, artist or clothing brand may wish to demonstrate their devotion to others by purchasing the real thing instead of using a fake. As with physical merchandise, some people will be content with counterfeits if such are available, while some will value the idea that a commodity is "authentic" in relation to some external referent. The purely aesthetic visual experience from both is the same, but the social value of the fake may be very different.

Many games and services also sell seasonal decorations like Christmas trees and Halloween masks. Unlike brands and pop culture icons, these more general (Western) cultural references seem to be perceived as more compatible with fantasy worlds as well. MMORPGs from *MapleStory* to *World of Warcraft* feature Christmas-inspired items, even though strictly speaking Christmas is not part of their fictional world. In another instance of cultural reference, many players in *EVE Online* seem to have a strong urge to express their real-life national identity in some way. In the fictional universe of the game, all memory of earthly nations is lost, so no national flags or other national symbols are available. To work around this limitation, players use colored characters to construct national flags on their profiles.

4.4 Summary of findings

What follows is a brief summary of the findings described above. Purely "utilitarian" or use-value-based attributes can be divided into two categories: performance (sim-

Table 2 Virtual item attributes acting as purchase drivers

Functional attributes	Performance Functionality
Hedonic attributes	Visual appearance and sounds Background fiction Provenance Customisability Cultural references Branding
Social attributes	Rarity

ple numerical advantage) and functionality (new abilities and options). Virtual goods also have attributes capable of generating emotional or hedonic responses, particularly their visual appearance and sound, but also any background fiction or narrative associated with them. Hedonic attributes are difficult to distinguish empirically from the conceptually different social attributes, which refer to attributes that make virtual items suitable for creating and communicating social distinctions and bonds. Such attributes are provenance, customisability, cultural references and the “branding” of an item with a known commercial brand. Rarity is perhaps the most socially oriented attribute of virtual goods, because its value is strongly associated with its ability to distinguish a (small) group of owners from non-owners. The nine attributes identified above are presented in Table 2.

5 Conclusions and discussion

Selling virtual goods for real money is an increasingly common revenue model not just for games and virtual worlds, but for mainstream online services as well. The purpose of this paper has been to improve understanding of the model by examining why people purchase virtual goods. Previous studies [12, 19, 25] have mostly focused on the consumer, examining individuals’ motivations and the decision processes that lead to virtual item purchases. Actual uses of the items are broadly speaking discussed in terms of two categories: “functional” and “decorative” [26]. Sociological consumption research suggests that goods in general can be seen as having three kinds of uses: functional, individual emotional and social. Using these notions as a starting point, an empirical analysis was conducted to yield a more detailed understanding of what attributes of virtual goods can drive consumers’ purchase decisions. The result is a list of nine attributes, presented in Table 2.

The nine attributes are consistent with Nojima [25] and Lehdonvirta [19], and can be seen as an expansion of the functional/decorative dichotomy used by Oh and Ryu [26] and others. The functional category is further divided into performance and functionality, while the decorative category is replaced with a number of hedonic and social attributes. Functional, hedonic and social attributes can co-exist simultaneously in the same item, different attributes being brought to the foreground as the item is used in different situations and for different purposes. For example, a

sword might be used for fighting (performance, functionality), for showing off one's equipment (appearance, customisability), or placed in storage as part of a collection (provenance, rarity). It could even be speculated that in some cases the functional attributes of a virtual good serve only as an excuse for a purchase that is primarily motivated by hedonic or social aspects, a technique commonly applied in marketing high-performance automobiles.

In general, the results suggest that virtual items are valued for many of the same reasons as more tangible commodities. They also support the notion of virtual assets as a distinct category, separate from information goods, as discussed in section two of this paper. While information goods can deliver the same kinds of emotional and aesthetic sensations as virtual goods, both being computer-mediated, virtual goods are more suited to creating and maintaining social distinctions and bonds because of their built-in rivalry and scarcity.

In applying the results to design, it is important to note that several of the attributes represent a *positional* characteristic instead of an absolute one: their value stems from how they compare to other goods and the surrounding environment. In order for a sword to be considered sharp, there must exist a blunt sword that can be used as a reference. The objective of the designer is thus not to attempt to "maximise" each item on every dimension. For each attribute, the designer should consider a whole spectrum of commodities and their interaction with the surrounding environment. This applies in particular to performance, rarity and some aesthetic features. Provenance and customisation can also give rise to positional hierarchies, but this does not necessarily require limiting their enabling features to certain items only. Cultural references and branding are perhaps better conceptualised as horizontal design spaces than as vertical hierarchies. The attributes in Table 2 can be used as a checklist by designers for creating a variety of parallel tensions between virtual goods.

5.1 Limitations and further research

While the level of abstraction was chosen so as to produce tangible attributes that developers have control over, the resulting nine attributes could arguably be broken down further into more detailed features. These could be specific to a service and type of good, for example, the effect of color on the sales of virtual scooters in *Cyworld*. While this might be useful in a marketing study for a specific service, in this study the aim was to maintain the possibility of generalisability across services. The sample of cases used in the study was saturated in the sense that newer observations, such as those from *Facebook*, did not suggest attributes that could not be placed into categories already identified from earlier cases.

The eclectic method used in the empirical part was partly dictated by the available data and is to some extent justified by the novel subject matter and explorative approach, but can be seen as detracting from the overall credibility of the findings. Which attributes identifiable in the material are worth a separate entry on the results table is largely up to the author's judgment. On the other hand, while a study based on, for example, a large number of structured interviews could yield more reliable (i.e. repeatable) results, it is not certain that the results would be equally broad. Consumers can be unconscious of or unwilling to disclose emulative motivations, as

recognised already by Veblen [32] in his observations. The emphasis in this paper was on generating a range of results that can be used as the basis for hypotheses in follow-up studies. A survey-based study of the users of a virtual item platform is being prepared to examine how different user segments respond to the different attributes and to what extent the attributes can be verified as orthogonal measures in a quantitative study.

In this paper, virtual consumption was examined through virtual goods and their various attributes as the central concept. This goods-centered approach is complementary to the consumer-centered approaches of some previous studies. A third front that would be equally valuable in understanding virtual consumer behaviour should focus on the design and mechanics of the games and platforms that contain the goods. This could be comparable to the approach commonly used in electronic commerce research that examines how user interfaces, information presentation styles and community features affect buying behaviour in online stores (e.g. [14]). On all three fronts, the emphasis should gradually shift towards more quantitative studies and applying the findings to practice.

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Vili Lehdonvirta is a researcher at Helsinki Institute for Information Technology HIIT, focusing on virtual consumption and real-money trade of virtual property. He graduated from Helsinki University of Technology in 2005 with a M.Sc. (Tech.) in Knowledge Intensive Business and is pursuing a Ph.D. degree in Economic Sociology at Turku School of Economics, Finland. He is currently a visiting researcher at Waseda University, Tokyo. Before joining HIIT, Vili worked as a game developer, creating casual multiplayer online games. He is the co-founder of Virtual Economy Research Network, <http://virtual-economy.org>.