

## Segmenting Consumers via Perceptions of Brand Value in Virtual Worlds

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### Abstract

Virtual worlds are emerging as a promising new channel for online marketing and brand-building. However, little is understood about the perceptions of the many consumers experiencing brands in virtual worlds such as Second Life. This paper examines the spectrum of perceptions of consumers of four major real-life brands (Armani, Dell, Mercedes and Hublot) that have established operations in Second Life. A survey was conducted using an avatar survey bot (n=1039). Using the FIMIX-PLS procedure (Ringle, Wende and Will, 2009), an axiological measurement instrument for brand value and formative modelling techniques, we identify segments of consumers with different perceptions of value for each brand. The analysis shows a clear difficulty in establishing 'emotional' consumers in Second Life. The paper rounds off with conclusions and implications for research and practice.

Keywords: virtual worlds; brand; axiology; value; segmentation; PLS; FIMIX

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### Introduction

Three-dimensional, computer-generated ‘virtual worlds’ are emerging as a potentially important channel for companies to communicate with current and potential customers, and many companies have made investments in establishing a presence in this new environment. Second Life, for example (see Figure 1 below), the best known and one of the broadest virtual world platforms had well over 100 real-life brands in 2008 (KZero, 2007; New Business Horizons, 2007). Many virtual worlds, such as Second Life, have a solid foundation for commercial growth, including an in-world currency, customisation of avatars and objects, concepts of property ownership, text and/or voice communication, and numerous different marketplaces and communities (Castranova 2005; Manninen and Kujanpää 2007). Virtual worlds are a complex phenomenon because they offer many kinds of marketing experiences hitherto unseen in a single channel (Kleeberger, 2002; Vedrashko, 2006). Virtual worlds are not only designed to entertain users (customers), but also to engage them in an experience. The use of multiple senses in this experience can make it much more effective (Kroeber-Riel and Weinberg, 1999, p. 123), and this is even more the case in emotional, new or unstructured stimulating environments of the kind seen in many virtual worlds.

There are well over a hundred virtual worlds, and more are under development. These include virtual worlds aimed at different age groups such as pre-teen, teen and adult, and those that are centered around a specific brand (e.g. Neopets, Stardolls, Disney Fairies, Virtual MTV, Barbie World, Fusion Fall (Cartoon Network) and Lego Universe) or general in their focus (Second Life, Multiverse, Active Worlds, There, Qwaq and Kaneva). Second Life, the best known and one of the broadest virtual world platforms, has grown rapidly from 2 million residents in January 2006 to nearly 15 million residents in August 2008 (Second Life 2008). In July 2009, there were nearly 28 million transactions and more than US\$461 million were spent in the year to June 2009 (Second Life 2009). Residents owned 1,743 million square meters of land and the million or so residents that logged in July 2008 spent 39.8 million hours in Second Life, nearly nine times that of July 2006 (Second Life 2009).

The problem of brand-building in virtual worlds is nascent. In an attempt to further contribute to understanding this new domain we embarked on a series of studies examining brand value in virtual worlds, focusing explicitly on the Second Life (SL) platform. The key research question for this paper is: “What dimensions of brand value do consumers perceive for real-life brands that have moved to the Second Life virtual world?” The approach we use to measure brand value is that of axiology (Hartman, 1967). As a formal theory it has been proven to be valid and reliable in marketing research (Lemmink and Mattsson, 1996; Mattsson, 1990; Mattsson and Wetzels, 2006; Ruyter et al., 1997). To identify different groups of consumers perceiving different elements of value we used the FIMIX procedure in SMART PLS. The remainder of this paper reports on the methodology employed, research results, before drawing conclusions and implications for research and practice in this area.

### Methodology

An axiological scale to measure brand value in virtual worlds was developed in a previous study (Barnes and Mattsson, 2008) and is shown in Table 1. Different value types are constructed from three value dimensions: Emotional (E), Practical (P) and Logical (L). The

formal expression of value, namely Value = Perspective – Object, makes it possible to construct nine different combinations of value dimensions. Both the Perspective and the Object components of the equation can become emotional, practical, and logical. Hence we have the following nine combinations (denoting E=emotional, P=practical and L=logical) in descending order of value: E-E, E-P, E-L, P-E, P-P, P-L, L-E, L-P and L-L. Each one has a corresponding survey item to tap into the particular value type. For example, “Armani does me good” is representing the combination P-E. The Object component is the unique individual “me”, an emotional dimension. The Perspective component is captured by (Armani) “does...good” a practical dimension. Thus the item is infused with the theoretical combination P-E. An overall item is also included to assess the overall value or goodness of the brand in SL, for example, “Armani s is a good brand.”

**Table 1: Axiological Measurement Instrument for Brand Value (Armani Example)**

Item	Value type	Item
1	E-E	I feel great pride identifying with Armani.
2	E-P	What Armani delivers feels right for me.
3	E-L	I feel I am able to trust Armani completely.
4	P-E	Armani does me good.
5	P-P	Armani is a satisfying buy.
6	P-L	What I get from Armani is worth the cost.
7	L-E	The uniqueness of Armani stands out.
8	L-P	Armani is a symbol of quality.
9	L-L	Information about Armani is always correct.

The survey was delivered in this study via avatar survey bots (ASBs) operating in SL. The ASBs were programmed and run by GMI, Inc. A number of safeguards were implemented to protect validity of responses. An incentive of L\$250 (approx. US\$1) was further provided to respondents. To ensure valid responses for each brand, each ASB was positioned in the actual brand location in SL: Mercedes (automotive sector), Dell (consumer electronics sector), Armani (apparel sector) and Hublot (luxury sector). This ensures that respondents have come to experience the SL brand location and do not answer the survey blindly. In all we obtained 1039 responses across the four brands. Some 38% of the sample was male and 62% female, with a median age of 25 to 34 years and a median weekly usage of 10 to 30 hours. Overall, Armani was rated as the best brand in terms of overall mean of ‘goodness’ (5.60), followed by Dell (5.35), Mercedes (5.33) and Hublot (4.87).

We assessed the dimensionality of the scale using a confirmatory covariance approach reported in another study (Barnes and Mattsson, 2009). The data in this study confirmed that a three-dimensional second-order axiological model is the best fit on the data ( $\chi^2=146.70$ ;  $df=24$ ;  $GFI=0.970$ ;  $AGFI=0.944$ ;  $CFI=0.981$ ;  $RMSEA=0.070$ ). Further, the PLS model was tested on each of the four new brand samples. All items loaded very significantly on their appropriate dimensions ( $p < .001$ ), validity (AVE) and reliability are strong ( $AVE > 0.5$  and  $pc > 0.8$ ), as per Fornell and Larcker (1981) and Straub and Carlson (1989), and  $R^2$  is substantial across the four brands, ranging from 0.454 to 0.710, demonstrating strong explanatory power in the axiological model.

The data for each brand was analysed using the FIMIX-PLS procedures in the Smart PLS software package (Ringle, Wende and Will, 2005). FIMIX is a new technique that allows different groups (or segments) of respondents with similar path models to be identified. FIMIX-PLS is a methodology that has been developed by Hahn et al. (2002) to capture this kind of heterogeneity for a pre-determined number of K latent classes. A comprehensive

FIMIX-PLS application involves: (1) identification of an appropriate number of segments using the FIMIX-PLS procedure; and (2) a priori segmentation of data, segment-specific estimation of the PLS path model and interpretation of the results (Ringle, Wende and Will, 2009).

## Results

Table 2 shows the results of the application of the FIMIX-PLS procedure to the data from each of the four brands in Second Life (Ringle, Wende and Will, 2009). Based on value of 1.00 for entropy (EN), with supporting evidence from the high values of the Akaike Information Criterion (AIC), Controlled AIC (CAIC) and Bayesian Information Criterion (BIC), there are clearly three axiological segments identified for Armani consumers. This is also very clearly the case for Hublot. The results are slightly more ambiguous for Mercedes, with two classifications (K=3 and K=6) receiving EN=0.74. However, given the higher values for AIC, CAIC and BIC, it is clear that K=3 is the strongest classification. For Dell, K=4 receives the highest value for EN, although other indices for K=5 are very slightly better. Our classification is based on the value for entropy and thus four segments are selected. The data set for each brand was subsequently split into the appropriate number of segments identified and separate PLS path models were created. The results are summarised in Table 3.

ANOVA and  $\chi^2$  analyses were also conducted to test for differences between the segments for gender, age and experience with using SL. Interestingly only one difference was found and this related to age for Mercedes: segment two, which was slightly older than the other segments ( $p < 0.05$ ) perceived strong practical value for the brand (“does me good”, “satisfying buy” and “worth the cost”). A further analysis by income might suggest that this group is also more affluent, but on this occasion the data was not collected.

**Table 2: FIMIX-PLS Analysis for Brands: Fit Indices**

		2 Segments	3 Segments	4 Segments	5 Segments	6 Segments
<b>1. Armani</b>	AIC	591.42	-3615.97	-3544.13	-1785.35	-1825.12
	BIC	622.40	-3567.78	-3478.72	-1702.73	-1725.29
	CAIC	622.44	-3567.72	-3478.64	-1702.63	-1725.16
	EN	0.46	<b>1.00</b>	0.77	0.65	0.61
<b>2. Dell</b>	AIC	372.71	488.55	-3248.80	-3277.11	-1202.75
	BIC	403.09	535.81	-3184.67	-3196.11	-1104.86
	CAIC	403.13	535.87	-3184.58	-3196.00	-1104.73
	EN	0.54	0.42	<b>0.77</b>	0.75	0.59
<b>3. Mercedes</b>	AIC	630.81	-6638.85	-6331.66	-6281.13	-6116.35
	BIC	665.37	-6585.08	-6258.69	-6188.96	-6004.97
	CAIC	665.40	-6585.04	-6258.63	-6188.89	-6004.89
	EN	0.51	<b>0.74</b>	0.71	0.73	0.74
<b>4. Hublot</b>	AIC	526.97	-7985.71	-7225.98	-7031.63	
	BIC	558.59	-7936.52	-7159.23	-6947.31	Segments
	CAIC	558.62	-7936.47	-7159.15	-6947.21	too small
	EN	0.41	<b>1.00</b>	0.89	0.88	

In order to be of relevance an item (value type) needs to be on a significant path in the model. Together these items constitute the value pattern of a brand. The formative path models generally display very high  $R^2$  values, with eight of the ten models being 0.616-0.963. More modest  $R^2$  were displayed for segment two of Mercedes ( $R^2=0.181$ ) and segment one of Armani ( $R^2=0.266$ ). We can see from Table 3 that segments one and two are clearly differentiated between consumers that perceive largely emotional value in the Armani brand

and those that perceive only logical and negative practical value. Both groups are quite large ( $n=98$  and  $n=81$  respectively). The first segment sees E-E and E-L in the Armani brand but only just significantly ( $p<0.05$ ) and the level of  $R^2$  is small; the second segment sees strong L-E and L-P ( $p<0.001$ ) and a weaker P-L ( $p<0.05$ ). For the Dell brand, we find three segments differentiated by those that see practical value, those that perceive logical value and a very small group that see emotional and logical value ( $n=19$ ). The first segment perceive E-P, L-L and negative L-P ( $p<0.05$ ), segment two see very clear L-P and L-L ( $p<0.001$ ), whilst segment three see clear strong P-P and P-L ( $p<0.001$ ). For Mercedes we see a segment with a very clear perception of logical value for all three items ( $p<0.001$ ) and another segment with a perception of value for all practical items (P-E,  $p<0.001$ ; P-P and P-L,  $p<0.05$ ). Segment two has a weak  $R^2$ . Finally, for Hublot we find three segments, two of them quite small ( $n=31$  and  $n=39$ ). The largest segment sees practical and negative logical value: P-P and P-L ( $p<0.001$ ), and L-E, L-L and negative P-E ( $p<0.05$ ), while segment one sees emotional value in E-E ( $p<0.001$ ), E-P ( $p<0.01$ ) and E-L ( $p<0.05$ ) and segment three perceives a different pattern of logical and practical value based on P-P and L-P ( $p<0.001$ ) as well as P-L ( $p<0.01$ ).

**Table 3: PLS Formative Path Model Analysis for FIMIX Segments by Brand**

		Armani <sup>a</sup>		Dell <sup>b</sup>			Mercedes <sup>c</sup>		Hublot		
		Seg. 1 <i>n=98</i>	Seg. 2 <i>n=81</i>	Seg. 1 <i>n=19</i>	Seg. 2 <i>n=50</i>	Seg. 3 <i>n=82</i>	Seg. 1 <i>n=128</i>	Seg. 2 <i>n=82</i>	Seg. 1 <i>n=31</i>	Seg. 2 <i>n=178</i>	Seg. 3 <i>n=39</i>
E	E-E	0.532*	0.653**	-0.060	-0.278	0.210	0.594***	-0.176	0.575***	0.237	0.690
	E-P	0.308	0.107	0.942*	0.368**	0.206	-0.022	0.593	0.286**	0.337	-0.495
	E-L	0.429*	0.394	0.194	0.856***	0.723***	0.564*	0.742*	0.354*	0.505	0.557
P	P-E	0.226	0.402	0.320	0.198	-0.066	0.406**	0.636***	0.016	-0.212*	0.056
	P-P	0.807	0.104	0.884	0.703	0.483***	0.237	0.397*	-0.043	0.638***	1.009***
	P-L	0.214***	0.643*	-0.307	0.297	0.640***	0.522**	0.389*	1.007***	0.591***	0.628**
L	L-E	0.720*	0.427***	0.506	0.255	0.283	0.231***	0.465*	1.087**	0.649*	0.217
	L-P	0.602*	0.794***	-0.837*	0.798***	0.625***	0.722***	0.655**	0.241	-0.090	0.824***
	L-L	-0.046	-0.087	1.221*	0.037***	0.210	0.190***	0.349	-0.170	0.507*	0.253
E ->Overall		0.462***	-0.040	0.514*	-0.076	-0.078	-0.036	-0.005	0.992***	0.074	-0.145
P ->Overall		0.101	-0.296*	-0.271	-0.070	1.100***	-0.034	0.333***	-0.068	1.312***	0.674***
L ->Overall		-0.029	1.216***	0.494*	1.075***	-0.089	1.013***	0.135	-0.066	-0.424**	0.535***
R-Squared		0.266	0.940	0.617	0.937	0.937	0.937	0.181	0.842	0.963	0.854

Notes: Significance levels are denoted by \* (5%), \*\* (1%) and \*\*\* (0.1%).

Results in italics indicate items that are on the significant path.

<sup>a</sup> Smart PLS was unable to calculate a path solution for segment 3 ( $n=52$ ) and this is therefore omitted.

<sup>b</sup> Smart PLS was unable to calculate a path solution for segment 4 ( $n=65$ ) and this is therefore omitted.

<sup>c</sup> Smart PLS was unable to calculate a path solution for segment 3 ( $n=124$ ) and this is therefore omitted.

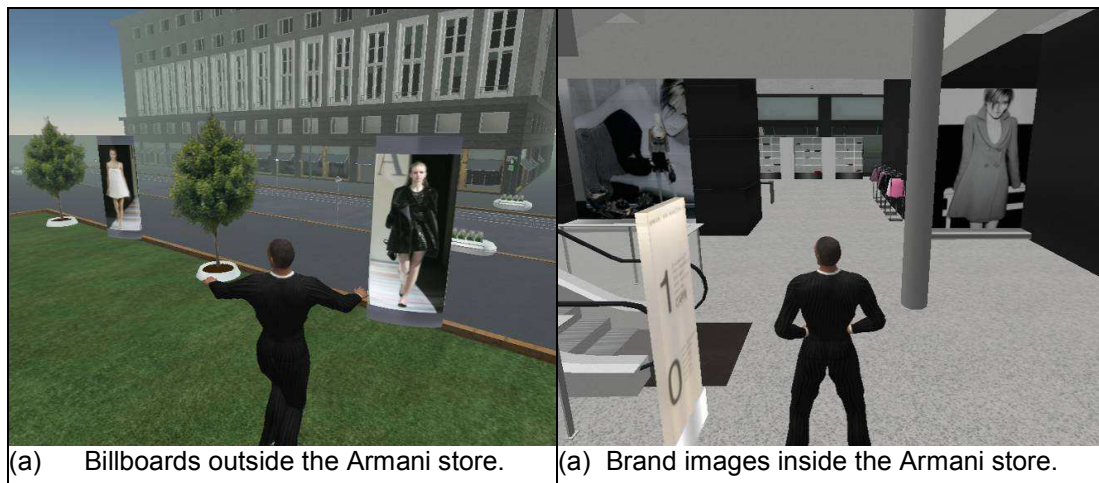
Overall, it is clear that there are different groups of consumers in Second Life with different perceptions of the brands. In most cases the segmentation is very clear, with high entropy values, strong  $R^2$  and very significant binding to the values in question. The dimensions that were perceived most commonly among consumer segments for the brands were the logical dimension, followed by the practical dimension. The emotional dimension was not particularly apparent except for in the Armani brand, where it was just significant, albeit with a low  $R^2$ , and for Hublot and Dell where the segments were very small. Clearly, except for Armani, the brands have not succeeded in developing significant perceived emotional value.

## Conclusions

This study represents the first research effort to attempt to systematically and rigorously segment groups of consumers using path modelling in SL. This has resulted in the clear

identification of different groups with very different perceptions of values perceived in the four brands under investigation. This suggests that SL users should in no way be considered as a homogenous group of consumers in terms of their perceptions. However, the research does appear to indicate that the segments show little difference in few demographic characteristics measured, suggesting that it may be possible to enhance brand values to influence similar consumers to move between segments. One dimension in which improvement is required is emotional value. It is noticeable that little or no emotional value was created by three of the four brands. Only the most powerful brand – Armani – had significant emotional value. The brand patterns that emerge are perhaps not surprising. Emotion is not created without significant interaction and engagement from the customer and that is something that the SL locations fail to really provide at this stage. The emotional real-world brand and the images displayed around the up-market, recreated Armani store do help to create a feeling of emotional brand value (see Figure 1), but the static nature of the location and the lack of interactivity draw doubt over the sustainability of this. Overall, the majority of immersed users of the SL experience only typically see Practical and Logical dimensions.

**Figure 1: Armani's Brand Offering in Second Life**



The implications are that underperforming virtual world brand experiences need to improve. To build emotional brand value—which appears at the top of our axiological instrument—firms need to advance in terms of the inclusion of emotional content (i.e. carefully chosen brand images and other multimedia) and interactivity that drive a positive emotional experience that, in turn, creates very high brand value (e.g. the Gossip Girl TV series at the Warner Bros. location in SL). Static experiences that are not periodically updated and that do not create a compelling reason for repeat visits or word-of-mouth are unlikely to create more than low-end, short-lived value. Moving a brand into the virtual world is fraught with complexity, as the closure of SL operations of brands such as Adidas, Reebok, AOL, Mercedes, Hublot, American Apparel and Armani testify. Additional effort is required in translating branding approaches to fit the more absorptive, individualized and highly interactive nature of the channel, its altered reality and that of its residents.

This paper has contributed to the understanding of brand value in these new environments. The development and application of the theoretical scale demonstrates the complexity in conveying brand messages and clear differences between these little-known consumers. Future research will seek to apply the axiological model to SL-only brands, and to capture larger samples and more characteristics for segmenting consumers in this new medium.

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