A Hierarchical Model of Virtual Experience (VE)

and Its Influence on Customer Perceived Value and Loyalty

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Abstract

A third-order hierarchical model of Virtual Experience (VE) is empirically examined. Social presence, social capital, flow and situational involvement are suggested to explain the holistic Virtual Experience (VE) construct. Furthermore, this measurement model of holistic VE is then empirically tested to determine its influence on customer value perceptions and loyalty. The context for this study is a student project in a virtual environment, SecondLife. Based on a sample size of 229 respondents, collected from bachelor degree students participating in a virtual class, Partial Least Squares (PLS) is used to explore the relationships in the conceptual model. In the hierarchical model, the results indicate that VE is comprised of second order variables (i.e., communal and individual experience). In the causal model, VE is tested as an antecedent of value perceptions and loyalty. The results indicate that VE positively influences the perceptions of economic and social value, in turn influencing customer's loyalty both in the real world and virtual world environments. The study of holistic virtual experiences in VWs environments can deepen our understanding of individual and social drivers and provides a clearer understanding of roles and influences of customer's experience in VWs.

Keywords: Hierarchical model; Metaverse; Virtual experience; Flow; Social capital; Presence; Perceived value; Customer loyalty

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1. Introduction

Virtual Worlds (VWs) are defined as "a synchronous, persistent network of people, represented as avatars, facilitated by networked computers" (Bell, 2008, p. 2). VWs have become increasingly popular in recent years, with over 200 million registered avatars in nine VWs (Kingsley and Wankel, 2009). For example, more than half a million users weekly log in to SecondLife. The most recently popular VW communities are SecondLife, Active Worlds, Kaneva, Multiverse, BrandWorlds and Worlds.com. The implementation of VWs is being ubiquitously applied in many industries with even training and distance educational services using VWs to explore new educational environments that can enhance learning effectiveness. Because of its popularity and potential implications, there has been an explosion of interest in studying and measuring Virtual Experience (VE) (Novak, Hoffman and Yung, 2000; Takatalo, Nyman and Laaksonen, 2008; Faiola and Smyslova, 2009; Thomas et al., 2010). So far, however, there has been little discussion about the holistic VE and its influence on customer perceived value and company and brand loyalty. Prior research tended to focus on the components of the individual's experience rather than the holistic experience. For example, Faiola and Smyslova (2009) investigated the impacts of flow experience and telepresence on human computer interaction and found that flow experience is positively correlated with telepresence of an individual participating in VWs. The aims of this paper are twofold: first, in a VW context and using partial least squares (PLS), we empirically test a second and third order hierarchical model of holistic VE comprising both individual and communal experience. Second, we investigate the direct and indirect influences of customers' communal, individual and holistic experience on perceived value and loyalty. Refer to *Figure 1*.

2. Hierarchical Measurement Model and Causal Model Development of Holistic VE

The study of holistic VE is exploratory and hence some relationships in this model have not been previously tested. Therefore, the use of PLS technique is justified (Ainuddin et al., 2007). PLS is often used to test and validate exploratory models. In addition, PLS is robust because it does not require large sample sizes or normally distributed data (Julien and Ramangalahy, 2003). In our study, PLS was used for both the hierarchical measurement model and the causal model of holistic VE. In *Figure 1*, the hierarchical model aims to understand the holistic VE, treated as a latent construct based on a number of lower-order dimensions. In addition, the measurement model for VE is a reflective higher-order model. From literature reviews, we assume that two major dimensions of the holistic VE comprise of communal (i.e., social presence and social capital) and individual experience (i.e., flow and situational involvement). Then in the causal model, holistic VE is used to explain customer perceived value (i.e., economic and social) and loyalty (i.e., in the real world and virtual world).

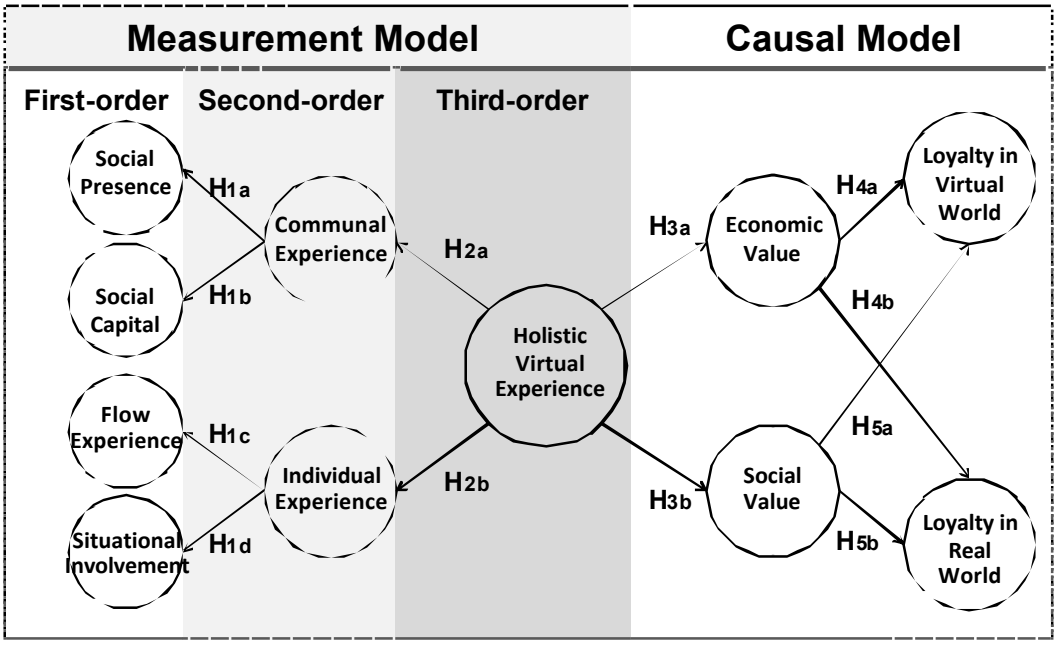

Figure 1: Hierarchical model of holistic virtual experience in VWs

2.1 The Hierarchical measurement of Holistic VE: Second- and Third-order structure

2.1.1 Communal Experience: Communal experience refers to the interactivity, mutual interdependence and awareness of other beings among members in a community leading to the feeling of belongingness, spirit, commitment and trust (Westheimer and Kahne, 1993; Rovai, 2002). VWs offer many opportunities for users to have individual interaction and enhanced communal experience. In this study, two theoretically social aspects that are social presence and social capital, a multi-dimensional construct and contributing to communal experience, are examined.

Social Presence: Previous studies propose that social presence is a psychological connection, creating a sense of sociality (e.g., warmth), human contact and social context cues. Several scholars suggest the conceptualisation of social presence embraces: (1) *sense of self-presence* (i.e., a sense of self-presence is defined as the ability of participants to project themselves socially and emotionally as "real people"); (2) *sense of co-presence* (i.e., the salience of the other person in the interaction); and (3) *sense of identification* (i.e., the feeling of belonging to the community) (Caspi and Blau, 2008; Heeter, 1992; Gerhard, Moore and Hobbs, 2004).

Social Capital: Paxton (1999) defines social capital as the combination of resources gained from the collective interaction among connected members. With regards to the representatives of networks and relationship quality, three main components of social capital are widely acknowledged: (1) *reciprocity* (i.e., mutual awareness and recognition of each other's contributions); (2) *civic virtue* (i.e., a form of citizenship behavior (e.g. sportsmanship and helping behavior) that positively relates to the success of a community); and (3) *social trust* (i.e., a willingness to rely on an exchange partner in whom one has confidence) (Bhandari and Yasunobu, 2009; Fukuyama, 1995; Gamm and Putnam, 1999; Paxton, 1999; Coleman, 1990).

On the basis of the above discussion, the following hypotheses are proposed:

$H_{1a\text{-}1b}$: Communal experience is positively associated to social presence and social capital, respectively.

2.1.2 Individual Experience: Motivation plays a central role in computer-related activities and experiences (Smyslova and Voiskounsky, 2009). Individual experience in this paper is predicated on the total state of individuals' gains from intrinsic and extrinsic motivation driving their participation in a VW environment. According to Huang (2006), both flow and involvement are motivational constructs. While flow experience explains hedonic behaviour of an individual's experience, situational involvement explains utilitarian behaviour of the experience (Hoffman and Novak, 1996). Then, in this study, two theoretically motivational aspects that are flow experience and situational involvement, a multi-dimensional construct and contributing to individual experience, are examined.

Flow experience - intrinsic involvement: Flow experience is a positive psychological construct linked to intrinsic motivation. It was firstly coined by Csíkszentmihályi in reference to "*the holistic sensation that people feel when they act with total involvement*" (Csikszentmihalyi, 1977, p. 36). Three components are widely studied and recognised as necessary for achieving flow experience: (1) *control* (i.e., the product of the interaction between challenge and skill. When people gain more experience, leading to a perception of, at least, increased skill, they will feel they have more control over the environment); (2) *enjoyment*; and (3) *attention focus* (Koufaris, 2002; Webster, Trevino and Ryan, 1993; Ghani and Deshpande, 1994; Huang, 2006; Novak, Hoffman and Yung, 2000).

Situational involvement - extrinsic motivation: Consumer behaviour researchers suggest that individuals' involvement in any situation they experience is a function of situational and intrapersonal determinants. Its level is determined by: (1) *personal relevance* (i.e., "importance" relating to high involvement of the individuals); (2) *curiosity* (i.e., a positive motivation related to naturally inquisitive behavior such as inquisitiveness, pursuit, exploration, investigation, desire for knowledge); and (3) *interest* (i.e., a quality of something that attracts individuals' attention or makes them want to know more about it) (Celsi and Olson, 1988; Huang, 2006; Kashdan, Rose and Fincham, 2004; Hoffman and Novak, 1996).

Then, the following hypotheses are proposed:

$H_{1c\text{-}1d}$: *Individuals' VE is positively related to flow and situational involvement, respectively.*

Based on the above discussion, the VE is expected to consist of both individual and communal experience. Hence, the following hypotheses are proposed:

$H_{2a\text{-}2b}$: *Holistic VE is positively related to communal and individual experience, respectively.*

2.2 The Causal Model: Virtual Experience as an Antecedent of Value and Loyalty

2.2.1 Holistic VE and Customer Perceived Value: In VWs, once people gain more individual and social experience, they begin to participate or create activities in the community, for example, joining a club, designing virtual goods or getting involved in economic transactions (Rothaermel and Sugiyama, 2001). With regard to the primary motive of seeking social support, people are willing to exchange information and share requested resources with others (Rheingold, 1993). Though social interaction in VWs happens between strangers, those social supports are valuable in creating a source of camaraderie, building further social bonds and facilitating future interaction. Moreover, these social supports facilitate not only social bonds but also transactions. Communities in VWs give people the opportunity to trade with other members and exchange resources beyond physical boundaries. Hence, an individual-level experience curve, gaining from social interaction and individual exploratory, tend to aware the value of social support and economic value in virtual community. Thus the following hypotheses are proposed:

$H_{3a\text{-}3b}$: Holistic VE has a positive influence to perception of both economic and social value, respectively.

2.2.2 Perceived Value and Customer Loyalty: To measure the commercial success of service providers in VWs, customer loyalty is a key metric. Prachlad and Ramaswamy (2003) suggest that customers' online experience is as critical as their offline experience when it comes to evaluating service quality, satisfaction and loyalty. In this paper, virtual loyalty of customers is comprised of two different elements: loyalty in real life and in VWs. For example, in virtual education, after perceiving value and gaining some experience with a particular virtual educational institute, learners tend to register for new courses provided in VWs, or they access related information and consider joining in real life (Wind, Mahajan and Gunther, 2002). On the basis of the above considerations, the following hypotheses are proposed:

$H_{4a\text{-}4b}$: Perceptions of economic value have a positive influence to loyalty in VW and real world.
$H_{5a\text{-}5b}$: Perceptions of social value have a positive influence to loyalty in VWs and real world.

3. Research Methodology

The context for this study was a student project in a virtual environment, SecondLife. All variables in the theoretical lower-order dimensions were measured using multi-item scales. Items for each concept were taken from the literature and adapted for a VW context. The sample size is 229, collected from the bachelor degree students participating in a brand management class. This class was partly taught in SecondLife, which enhanced the student's experience in implementing brand management in both the real and virtual worlds. Then, they were asked to visit the virtual island of a hardware manufacturer for hours. Finally, class project responses were collected via a structured questionnaire.

4. Results

To assess the reliability and convergent validity, *composite scale reliability* (CR) and *average variance extracted* (AVE) were calculated. Reliability was deemed acceptable if CR exceeded a value of 0.80 and the AVE figure exceeded a value of 0.50 (Fornell and Larcker, 1981). All variables were examined and met this requirement. As shown in *Table 1*, all variables' CR value are greater than 0.80 and the AVE of all measures exceeds the cut-off value of 0.50. Hence, these measurements are sufficiently reliable. Additionally, these measurements have discriminant validity because the square root of the AVE exceeds the intercorrelations of the construct with the others in the model (Chin, 1998).

4.1 Test of Hierarchical Structure

Next, Partial Least Squares (PLS) was used to explore the relationships in the hierarchical model. Path coefficients of the hierarchical model are presented in *Figure 2*. Due to the fact that the loadings of all second-order factors exceed 0.80, that is Communal Experience: 0.916 [Social Presence] and 0.849 [Social Capital]; and Individual Experience: 0.876 [Flow experience] and 0.857 [Situational Involvement], these findings provide empirical support for hypotheses H_{1a}-H_{1d}. Similarly, the loadings of the second-order factors on the third-order factors also exceed 0.80. Hence, the hypotheses H_{2a}-H_{2b} are supported. To provide confidence intervals for all parameter estimates in the measurement model, building the basis for statistical inference, nonparametric bootstrapping is calculated (Henseler, Ringle and Sinkovics, 2009).

The 1.645 ratio for unidirectional tests was set. In summary, all loadings were significant at the 0.05 confidence level providing evidence of second and third factors of VE

4.2 Testing Holistic VE as an Antecedent of Value and Loyalty

In the causal model, holistic VE is tested as an antecedent of value perceptions and loyalty. The results indicate support for all hypotheses with a significant effect at the 0.05 confidence level. The positive effect of holistic VE on the perceptions of economic value (H_{3a}: $\beta = 0.375$ [$p<0.05$]; $R^2 = 14.1\%$) and of social value (H_{3b}: $\beta = 0.565$ [$p<0.05$]; $R_2 = 31.9\%$) are indicated. Moreover, the results reveal that there are positive relationships between the value perceptions and customer loyalty in virtual world ($R^2 = 34.6\%$) that are explained by the perceptions of economic value (H_{4a}: $\beta = 0.307$ [$p<0.05$]) and of social value (H_{5a}: $\beta = 0.411$ [$p<0.05$]). Similarly, the positive relationship between the perceptions and loyalty in the real world can be observed ($R^2 = 35.9\%$) that are explained by the perceptions of economic value (H_{4b}: $\beta = 0.432$ [$p<0.05$]) and of social value (H_{5b}: $\beta = 0.297$ [$p<0.05$]). In summary, holistic VE positively influences perceptions of economic and social value, which in turn positively influences customer loyalty both in the real world and virtual world.

Variables	Composite Reliability	AVE	R Square	Cronbachs Alpha
Communal Experience	0.86	0.78	0.75	0.92
Economic Value	0.91	0.76	0.14	0.85
Flow	0.88	0.72	0.77	0.90
Individual Experience	0.87	0.75	0.66	0.91
Lolyalty in real world	0.89	0.73	0.36	0.82
Lolyalty in virtual world	0.90	0.76	0.35	0.84
Situational Involvement	0.88	0.70	0.74	0.89
Social Capital	0.87	0.69	0.72	0.89
Social Presence	0.87	0.68	0.84	0.91
Social Value	0.89	0.72	0.32	0.81
Virtual Experience	0.83	0.70	0.00	0.93

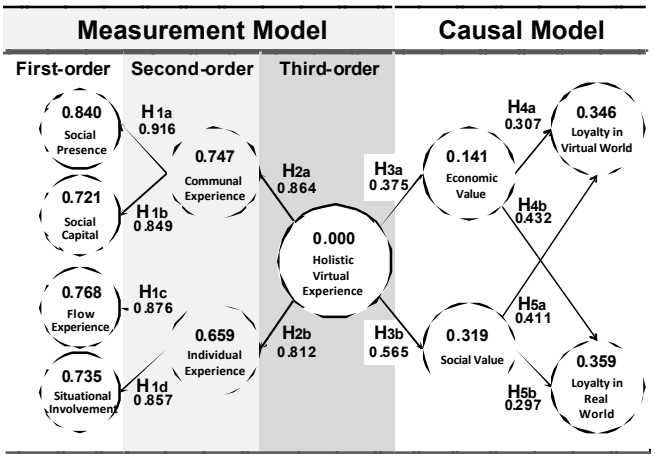

Table 1: Reliability and Validity of Variables **Figure 2: Path Coefficients of the Model**

5. Limitations, Contributions and Managerial Implication

Though the aim of this paper is to determine the holistic VE of individuals in SecondLife, the study context is in the educational sector and respondents are university students. So, the generalizability of the findings will be limited. However, despite that shortcoming, it nonetheless contributes to VE literature. The potential for contribution to knowledge lies in several areas. First, the study of holistic VEs in VW environments can deepen our understanding of individual and social drives. Next, the investigation of the relationship between holistic VE and customer value, both economic and social, provides a clearer understanding of the influences of customers' experience in VWs. Finally, the potential contribution to knowledge lies in a more precise picture of the interaction between customers' perceiving value and their loyalty towards VWs' interactions. For managerial implications, it is important for business to recognize the holistic customer experience influencing on perceived values and loyalty. For example, an educational institute can use VWs as a virtual, remote studying place to strengthen relationship and loyalty from customers. Students should be provided tools, space, and opportunity to enjoy individual virtual experience as well as to meet, learn, engage, and collaborate with other staffs and students.

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