

## Association for Information Systems AIS Electronic Library (AISeL)

ECIS 2009 Proceedings

European Conference on Information Systems  
(ECIS)

2009

# User-generated content (UGC) in tourism: Benefits and concerns of online consumers

Tibert Verhagen

*Vrije University*, [tverhagen@feweb.vu.nl](mailto:tverhagen@feweb.vu.nl)

Frans Feldberg

Bart van den Hooff

Selmar Meents

Follow this and additional works at: <http://aisel.aisnet.org/ecis2009>

### Recommended Citation

Verhagen, Tibert; Feldberg, Frans; van den Hooff, Bart; and Meents, Selmar, "User-generated content (UGC) in tourism: Benefits and concerns of online consumers" (2009). *ECIS 2009 Proceedings*. 98.

<http://aisel.aisnet.org/ecis2009/98>

This material is brought to you by the European Conference on Information Systems (ECIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ECIS 2009 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# UNDERSTANDING VIRTUAL WORLD USAGE: A MULTIPURPOSE MODEL AND EMPIRICAL TESTING

## **Tibert Verhagen**

Knowledge, Information and Networks research group, Faculty of Economics and Business Administration, VU University Amsterdam, De Boelelaan 1105, 1081 HV Amsterdam, The Netherlands. Tel. +31.20.4446050, Fax: +31.20.4446005, E-mail: [tverhagen@feweb.vu.nl](mailto:tverhagen@feweb.vu.nl)

## **Frans Feldberg**

Knowledge, Information and Networks research group, Faculty of Economics and Business Administration, VU University Amsterdam.

## **Bart van den Hooff**

Knowledge, Information and Networks research group, Faculty of Economics and Business Administration, VU University Amsterdam.

## **Selmar Meents**

Knowledge, Information and Networks research group, Faculty of Economics and Business Administration, VU University Amsterdam.

## **Abstract**

*This study reports an attempt to enhance our understanding of the reasons behind virtual world usage. By providing a mixture of utilitarian and hedonic value, virtual worlds represent an emerging class of multipurpose information systems (MPIS). Previous research seems to fall short in explaining MPIS adoption, especially since key extrinsic and intrinsic motivators are not considered. Drawing upon IT adoption research, motivation theory and the consumer behavior literature, this research extends available works and provides insight into the influence and roles of extrinsic and intrinsic motivation. Hypotheses are postulated and tested using a sample of 1627 users of the virtual world Second Life. The results confirm the majority of the hypotheses and support the comprehensive model. The findings indicate instantaneous effects of extrinsic and intrinsic motivation, and highlight reinforcing effects of intrinsic motivation. Implications for research and practice are discussed.*

**Keywords:** *virtual worlds, multipurpose information system, extrinsic motivation, intrinsic motivation, adoption behavior, escapism, visual attractiveness, entertainment value.*

# 1 INTRODUCTION

With increasing usage, the value of virtual worlds has been growing at an impressive rate. Parallel to their growth and diversified usage, virtual world systems have gradually advanced into more complex systems. Initially developed to serve gaming communities, virtual worlds were primarily designed in line with the *intrinsic motives* of those intending to use the system, that is, to create pleasurable experiences and provide self-fulfilling value (Ryan and Deci, 2000b). As such, these virtual worlds could be classified as *hedonic information systems* (cf. Van der Heijden, 2004). More recently, virtual worlds have started to fulfill a more instrumental role by enabling their users to perform rather utilitarian tasks such as getting insurances, following courses, and building and leasing stores. Accordingly, virtual worlds increasingly adapt to those willing to use the system for *extrinsic motives*, which relates to the achievement of goals/benefits external to the system-user interaction (Van der Heijden, 2004). From this perspective, virtual worlds contain characteristics that are distinctive for *utilitarian information systems* (see Van der Heijden, 2004). Given the mixture of hedonic and utilitarian functions, it becomes clear that the traditional distinction between these functions no longer applies to information systems like virtual worlds and thus demands revision. Mirroring the view of Hong and Tam (2006) on IT beyond work settings, we view virtual worlds as *multipurpose information systems* (MPIS). MPIS are defined here as information systems that provide an integrated suit of hedonic and utilitarian functions to their users.

In this paper we embrace the MPIS perspective, and introduce and test a comprehensive model of users' motivations to adopt virtual worlds. Given the multipurpose characteristics of virtual worlds, using an MPIS perspective encompassing both intrinsic and extrinsic motives seems crucial. The vast majority of research on IT system adoption, however, has focused on either hedonic (e.g., Van der Heijden, 2004) or utilitarian systems (e.g., Venkatesh, 2000). Consequently, these works fall short since they address only about half of a system's nature and therefore fail to provide an overall picture of the intrinsic and extrinsic motivators behind virtual world use. Furthermore, since the interrelationships between both types of motivators are relatively unexplored, possible synergies between hedonic and utilitarian system characteristics that might guide system developers remain untainted. This research intends to further our understanding of virtual worlds by introducing an MPIS model that captures both intrinsic and extrinsic beliefs and as such integrates the hedonic and utilitarian system paradigms.

The paper is structured as follows. We first discuss the literature on the nature and value of information systems, and address the relationships between information system value and consumers' IT adoption motivations. We conceptualize the key constructs in our model and formulate hypotheses. The research model is then tested in a large-scale survey within the virtual world Second Life. We will discuss the results of this empirical study, and the conclusions that can be drawn from them. Finally, we will describe the theoretical, methodological and practical implications of our findings.

## 2 THEORETICAL BACKGROUND

### 2.1 Information system value

Research on the adoption of IT has classified information systems according to the value they provide to users. Reflecting the user's overall experience of interacting with the system based on both the system's usefulness and provision of enjoyment and/or fun (adapted from Holbrook, 1986; Babin, Darden and Griffin, 1994), system value is assumed to be an important determinant of adoption behavior. A common value-based classification originated in the consumer behavior literature (e.g., Babin et al., 1994; Hirschman and Holbrook, 1982, Holbrook and Hirschman, 1982a), and is used to differentiate between utilitarian and hedonic information systems (cf. Van der Heijden, 2004).

*Utilitarian information systems* refer to systems that are mainly used to achieve goals that are external to system usage (Van der Heijden, 2004). As such, they provide instrumental utility to the user. *Hedonic information systems* on the other hand, are systems that are used for their own sake and provide feelings of enjoyment, pleasure, excitement and escapism (cf. Babin et al., 1994). The usage of hedonic systems is mainly experiential in nature, which implies that users strive for instant hedonic pleasure while the consequences of usage appear in the fun and pleasure of the experience itself (Holbrook and Hirschman, 1982a; 1982b).

While the distinction between utilitarian and hedonic information systems is widely accepted, and research has demonstrated the predictive power of this value dichotomy in explaining the relative weights of IT adoption determinants (e.g., Van der Heijden, 2004, Wakefield and Whitten, 2006), recent technological developments seem to challenge its applicability. In particular, we refer to the emerging class of systems that provide both utilitarian and hedonic value (e.g., smart phones; mobile data services; virtual worlds). These systems, alluded to in our introduction as MPIS, incorporate instrumental and experiential functions in one environment (Hong and Tam, 2006). A main challenge for developers of MPIS is how to apply an integrated suite of instrumental and experiential functions, in order to enable productive *and* prolonged use. Such integration demands a thorough understanding of the drivers of the adoption process and stresses the need for an integration and extension of theories concerning IT adoption and use.

## 2.2 Motivation theory

A significant body of research has applied motivation theory (Deci, 1975; Deci and Ryan, 1985) to predict the acceptance of information systems. Referring to “enduring predispositions that arouse and direct behavior toward certain goals (Engel, Blackwell and Miniard, 1995, p. g-9), motives are seen as key determinants of IT adoption. Two types of motivation exist: extrinsic motivation and intrinsic motivation.

*Extrinsic motivation* is defined as “doing something because it leads to a separable outcome” (Ryan and Deci, 2000b, p. 55). Extrinsically motivated behavior is driven by the instrumental value of the performed activity (Ryan and Deci, 2000b), which is derived from the outcome of the activity instead of the activity itself (Davis, Bagozzi and Warshaw, 1992). Given the instrumental value, extrinsic motives are theorized as dominant predictors of utilitarian system usage (Van der Heijden, 2004; Wakefield and Whitten, 2006). Most theories on IT adoption (see Venkatesh, Morris, Davis and Davis, 2003 for an overview) are productivity-oriented and use extrinsic motives such as ‘perceived usefulness’ and ‘perceived ease-of-use’ as key determinants of utilitarian system use.

*Intrinsic motivation* refers to “doing an activity for the inherent satisfaction of the activity itself” (Ryan and Deci, 2000a, p. 71). Intrinsically motivated behavior is self-determined, volitional (Deci and Ryan, 1985) and involves people engaging in activities that they find interesting, new, and optimally challenging (Deci and Ryan, 2000, p. 235). Intrinsic motivation derives its value from the appreciation of the activity itself rather than its instrumental outcome (Davis et al., 1992; Mathwick, Malhotra and Ridgon, 2001). Intrinsic motivation is closely associated with the general need for feelings of competence and autonomy, and integrally relates to emotions such as enjoyment and excitement (Deci, 1975; Deci and Ryan, 1985). The vast majority of IT adoption studies has centered on the intrinsic belief ‘perceived enjoyment’, which has been related successfully to hedonic system usage (see Davis et al., 1992; Van der Heijden, 2004; Wakefield and Whitten, 2006).

## 3 RESEARCH FRAMEWORK AND HYPOTHESES

This study applies an integrated approach to put forward a model of virtual world adoption. The logic behind the model structure is predicated on three theoretical considerations. First, using the attitude towards use as key independent variable, we include the general technology beliefs perceived

usefulness and perceived ease of use, as proposed in TAM. The empirical robustness of this structure supports the assumption that both constructs explain a substantial part of the attitude variance, and thus our decision. Second, we challenge the parsimony and claim to sufficiency of TAM and expand our model by including the extrinsic belief escapism and intrinsic beliefs visual attractiveness, intrinsic enjoyment and entertainment value. In line with research suggesting direct effects of ‘external variables’ on behavior (e.g., Hong and Tam, 2006; Van der Heijden, 2004) we posit direct effects of these beliefs on attitude. Third, based on classical drive theory (see Hull, 1943), we view intrinsic motivation as a reinforcer of extrinsic motivation. In the remainder of this section we elaborate on the model structure, and detail the research constructs and their hypothesized relationships.

### 3.1 General technology beliefs

Since its conception in 1989, the Technology Acceptance Model (TAM) has spawned a whole research tradition into the factors affecting adoption and use of various IT applications. This model is an adaptation of the theory of reasoned action (TRA) proposed by Fishbein and Ajzen (1975) which aims to explain and predict the behaviors of people in a specific situation. The core of TAM is built on two specific beliefs explaining user acceptance of information technology (Davis, 1989), namely perceived usefulness and perceived ease of use. Both these beliefs are extrinsic motivators, focusing on the instrumental value of system use (Venkatesh, 2000).

A fundamental assumption in TAM (and one that has received much empirical support) is that both these beliefs are positively related to attitude towards system use. This leads to our first two hypotheses:

**H1.** Perceived usefulness positively influences the attitude towards using virtual worlds.

**H2.** Perceived ease of use positively influences the attitude towards using virtual worlds.

Previous TAM-based research found that both beliefs are also mutually related, in the sense that a system’s perceived usefulness increases as its ease of use gets higher (Legris, Ingham and Colletette, 2003; Moon and Kim, 2001). Therefore, we hypothesize:

**H3.** Perceived ease of use positively influences perceived usefulness.

#### Escapism

As conceptualized by Hirschman (1983), escapism is an extrinsic motivation. It “offers the individual an avenue to a more desirable state of being than the one presently experienced” (p. 64), which means it has a utilitarian function as an anxiety reduction mechanism. At its core, escapism refers to users’ motivation to “‘leave’ the reality in which they live in a cognitive and emotional way” (Henning and Vorderer, 2001, p. 101). Although in consumer behavior research such motivations are often directly related to hedonic values (Babin et al., 1994; Bridges and Florsheim, 2007), and escapism can also be conceptualized as related to “playfulness” and “pretending” (Mathwick et al., 2001), we feel it is primarily an extrinsic motivation. The instrumental value that is derived from technology use (“getting away from it all”) is an important driver for behavior here. This is in line with Hirschman and Holbrook’s (1982) concept of “imaginative constructs of reality”, where acts are not based on what users know to be real, but rather on what they desire reality to be. Projective fantasies or absorbing experiences (Hirschman and Holbrook, 1982) can be strong drivers for the use of environments such as virtual worlds. The social play inherent in virtual worlds can be expected to positively contribute to this value, and thus to be positively appreciated by individuals with escapist motivations, leading to the following hypothesis:

**H4.** Escapism positively influences the attitude towards using virtual worlds.

In line with the above, it can be assumed that this motivation will not only directly exert a positive influence on attitude towards use, but will also be positively related to perceived usefulness, where

anxiety reduction is the benefit that can be derived from system use (Hong and Tam, 2006). Therefore, we hypothesize:

**H5.** Escapism positively influences perceived usefulness of virtual worlds.

### 3.2 Elaborating intrinsic motivations: enjoyment, entertainment and visual attractiveness

#### Intrinsic enjoyment

The TAM has received considerable empirical support over the years (Adams, Nelson and Todd, 1992; Davis and Venkatesh, 1996; Legris et al., 2003), and has seen numerous extensions in terms of new variables and relationships being added to the model. Because social play is an important element supported by virtual worlds, a relevant extension of TAM in the context of the study reported here is the inclusion of perceived enjoyment. Davis et al. (1992) first introduced perceived enjoyment as “the extent to which the activity of using the computer is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated” (p. 1113).

The variable of enjoyment is especially relevant in relation to information systems with a hedonic function. Previous research in Web-based environments has found empirical support for the influence of enjoyment on attitude towards using, and intention to use such environments (Moon and Kim, 2001; Van der Heijden, 2003). In terms of the hedonic function of using virtual worlds, enjoyment can be expected to be an important factor:

**H6.** Intrinsic enjoyment positively influences the attitude towards using virtual worlds.

In line with the relationship between perceived ease of use and perceived usefulness, perceived ease of use can also be associated with enjoyment. Venkatesh (2000) argues that users’ perceptions of ease of use are adjusted based on actual experiences with a system. More specifically, Venkatesh argues, the more a user enjoys the interaction with a system, the more they tend to “...’underestimate’ the difficulty of the means or process of using a system because they quite simply enjoy the process and do not perceive it as being effortful...” (p. 348). This line of reasoning is also found in Venkatesh (1999) and Wakefield and Whitten (2006) and leads to the following hypothesis which shows a reinforcing effect of intrinsic on extrinsic motivators:

**H7.** Intrinsic enjoyment positively influences perceived ease of use of virtual worlds.

#### Entertainment value

Entertainment value can be defined as the perceived degree to which the use of an information system is a pleasant and likeable experience (Ducoffe, 1996) and lifts the user’s spirit (Mathwick et al., 2001). Although both intrinsic enjoyment and entertainment value are fun-related notions, they are conceptually distinct. An individual may experience an information system as entertaining, regardless of the reason why he uses it. In contrast, when this individual intrinsically enjoys using the information system, the pleasure is not just an added benefit of using the system to pursue some other goal, but rather is actively sought after and a purpose in itself (cf. Brown and Venkatesh, 2005; Mathwick et al., 2001).

As was argued in the above, based on the literature it can be expected that perceived fun, in the sense of intrinsic enjoyment, positively impacts the attitude towards using the virtual world. Given that intrinsic enjoyment and entertainment value concepts share the element of fun, the same arguments apply to entertainment value. Indeed, the literature provides a substantial body of evidence suggesting a positive effect of entertainment value on digital environment related attitudes such as the attitude towards using an information system (Dabholkar and Bagozzi, 2002), towards a website (Richard, 2005), and towards online advertising (Xu, Liao and Li, 2008). Accordingly, it can be anticipated that:

**H8.** Entertainment value positively influences the attitude towards using virtual worlds.

Arguably, when the use of an information system is perceived to be fun this is likely to increase the degree to which this fun is seen as an end in itself. Therefore, it is expected that:

**H9.** Entertainment value positively influences intrinsic enjoyment of virtual worlds.

A system that entertains the user provides this individual with a service and shows that it is capable of achieving something that the user values, regardless of why the system is used. Therefore, it stands to reason that the more the system is seen as entertaining, the more this gives the user the indication that the system will also perform adequately when it is put to use to increase the individual's performance. This is supported by the research of D'Ambra and Rice (2001) who found a positive influence of entertainment value of websites on perceived personal performance. Consequently, we again hypothesize a reinforcing effect of an intrinsic on an extrinsic motivator:

**H10.** Entertainment value positively influences perceived usefulness of virtual worlds.

Visual attractiveness

The impact of the visual appeal of information systems on user perceptions and behavior has been investigated in the context of the World-Wide Web, Human Computer Interaction (HCI) and mobile commerce. For instance, visual attractiveness was found to be an important determinant of user satisfaction related to web site usage (Lindgaard and Dedek, 2003). Research performed in the field of mobile commerce revealed that design aesthetics appear to influence users' loyalty towards mobile applications (Cyr, Head and Ivanov, 2006). This line of reasoning can be extended to virtual worlds, as virtual world technologies fully support the development of visually attractive environments aiming at creating game-like user experiences. In line with previous research (e.g., Van der Heijden, 2003) we assume that the visual attractiveness of virtual worlds will be associated with a positive attitude towards using such environments:

**H11:** Visual attractiveness positively influences attitude towards using virtual worlds

Visual attractiveness has also been found to be related to perceived ease of use. For example, Tractinsky, Katz and Ikar (2000) found a tight relationship between users' perceptions of interface aesthetics and perceptions of the usability of an information system. Characteristics of the user-system interaction, such as visual appeal and usability, were found to play a role in driving perceived ease of use (Venkatesh, 2000). Van der Heijden (2003, p. 544) introduced the notion of "perceived visual attractiveness" defined as "the degree to which a person believes that the website is aesthetically pleasing to the eye" and found perceived visual attractiveness to positively influence both perceived usefulness and perceived ease-of-use. All in all, these findings lead to the following hypothesis, which again establishes a relationship between an intrinsic and an extrinsic motivator:

**H12:** Visual attractiveness positively influences perceived ease of use of virtual worlds.

## **4 METHOD**

### **4.1 Procedure**

We conducted a survey to collect empirical data. The sample consisted of Dutch registered users of the virtual world Second Life. An e-mail with an invitation to participate freely in the study was sent to a mailing list of 50.000 registered users. The invitation included a link that led to a web-based survey. As incentive, respondents were asked to fill in their e-mail address to engage in the raffle of ten book tokens of 20 euro. The online questionnaire addressed perceptions of perceived usefulness, perceived ease of use, escapism, intrinsic enjoyment, entertainment value, visual attractiveness, and attitude towards use. Moreover, socio-demographics were included.

## 4.2 Measures

Multi-item scales were used to measure the research constructs (see appendix). For each scale, items were collected based upon previous literature. We took care to solely select items that added to the conceptualization of the constructs as applied in our research. All items were part of reliable and validated measurement instruments. We tailored the items to the context of our study (i.e., made them target specific). All constructs were measured using 7-point Likert scales (strongly disagree-strongly agree).

## 4.3 Sample

The data was collected from the 29<sup>th</sup> of June to the 10<sup>th</sup> of July 2007. Eventually, 1627 respondents filled in the online questionnaire. The majority of the respondents was male (n=925; 56.9%), between 30 and 50 years old (n=862; 53%). A slight majority (52%, n=846) indicated to use Second Life once per week or more, while a minority (39.9%, n=649) reported to buy at Second Life. To investigate whether nonresponse bias posed a threat to the internal validity of the study, we compared the sample demographics with those of the population of Dutch Second Life users (cf. Armstrong, J.S., and Overton, 1977; Pavlou et al., 2007).<sup>1</sup> Overall, no large differences in these demographics were found. This suggests that nonresponse bias was not a major concern in this study.

# 5 RESULTS

We first applied EFA to test whether the measurement items only tapped into one underlying dimension. Then, Partial Least Squares (PLS) modeling was utilized to further assess the measurement model and to estimate the structural model<sup>2</sup>. PLS was selected since our model is rather complex and our research intends to develop rather than confirm theory (see Fornell and Bookstein, 1982). Moreover, PLS has some specific advantages including minimal demands on data distribution (Chin, 1995).

## 5.1 Test of dimensionality

EFA was run using the principal components model with the oblique rotation technique (Direct Oblimin). The data passed the thresholds for sampling adequacy (KMO MSA 0.957, Bartlett's test of sphericity 56554.6,  $p < .001$ ). Four items were removed since they demonstrated high cross-loadings. The final factor solution was then derived. Together, the 7 factors explained 84.6% of the variance in the data. Unidimensionality of the measures was confirmed since each item loaded highest on its intended factor. Moreover, except for one intrinsic enjoyment item, all items loaded very strongly on their underlying factors. As such, preliminary evidence for convergent validity and discriminant validity was provided.

---

<sup>1</sup> Data about the demographics of the Dutch Second Life user population was provided to us by the company responsible for Secondlife.nl.

<sup>2</sup> We initially planned to use Structural Equation Modeling (SEM). First analyses resulted in poor fit. In such situations, PLS can be seen as feasible alternative for SEM as it places fewer demands on normality of data distributions and residual distributions (Fornell and Bookstein, 1982).



## 5.2 Measurement model

PLS was used to assess the reliability and validity of the measures. We utilized the software package Smart PLS (Ringle, Wende and Will, 2005) of the University of Hamburg to compute factor loadings, Cronbach's alpha, composite reliability and Average Variance Extracted (AVE). In addition, SPSS (version 13, Mac) was used to compute minimum item-to-total correlations.

The results strongly confirmed the reliability of the measures. The alphas and composite reliability scores exceeded the value of 0.90, and all AVE's surpassed the 0.50 guideline (see Ping, 2004). Convergent validity was assessed by factor loadings (PLS), alphas, AVE's and minimum item-to-total correlations. All scores exceeded accepted rules of thumb (factor loadings: 0.70, see Ko, Kirsch and King, 2005; alpha: 0.80, see Ping, 2004; AVE: 0.50, see Wasko and Faraj, 2005; minimum item-to-total correlations, 0.40, see Jayanti and Burns, 1998). As such, convergent validity was established. Finally, we assessed for discriminant validity in two steps. First, we used the PLS output to study the within-construct item factor loadings and compared these loadings to across-construct item loadings (cf. Wasko and Faraj, 2005). Since all within-construct item loadings were high, and lower than the cross-loadings, discriminant validity can be assumed. Second, we studied the individual AVE's and compared the scores with the squared correlations among the constructs (cf. Chin, 1998a).

Construct	Perceived usefulness	Perceived ease of use	Escapism	Intrinsic enjoyment	Entertainment value	Visual attractiveness	Attitude towards use
Perceived usefulness	<b>0.81</b>						
Perceived ease of use	0.16	<b>0.91</b>					
Escapism	0.38	0.11	<b>0.81</b>				
Intrinsic enjoyment	0.21	0.17	0.25	<b>0.83</b>			
Entertainment value	0.41	0.23	0.44	0.53	<b>0.80</b>		
Visual attractiveness	0.23	0.16	0.27	0.34	0.51	<b>0.88</b>	
Attitude towards use	0.32	0.13	0.22	0.27	0.37	0.26	<b>0.82</b>

*Table 1: Discriminant validity: AVE's versus cross-construct squared correlations (note: the boldscores (diagonal) are the AVE's of the individual constructs. Of the diagonal are the squared correlations between the constructs).*

All AVE's exceeded the values of the squared correlations among the constructs in the corresponding rows and columns. As such, discriminant validity was demonstrated.

## 5.3 Structural model

We then estimated the path coefficients ( $\beta$ ) and  $R^2$  values of the structural model using the bootstrapping technique (1627 re-samples; cf. Hesterberg et al., 2003). To evaluate the significance and effect sizes of the path coefficients, we conducted two-tail t-tests with a significance level of 0.01 (see Blalock, 1979). The procedure of Chin (1998a) was applied to compute effect sizes.

Hyp.	Path	$\beta$	t-value	Sign.	Effect
------	------	---------	---------	-------	--------

					size
1	Perceived usefulness → Attitude towards use	0.294	10.528	<.001	0.09
2	Perceived ease of use → Attitude towards use	0.031	1.360	n.s.	0.00
3	Perceived ease of use → Perceived usefulness	0.114	5.298	<.001	0.02
4	Escapism → Attitude towards use	-0.004	0.152	n.s.	0.00
5	Escapism → Perceived usefulness	0.345	14.151	<.001	0.13
6	Intrinsic enjoyment → Attitude towards use	0.153	4.986	<.001	0.03
7	Intrinsic enjoyment → Perceived ease of use	0.262	9.255	<.001	0.06
8	Entertainment value → Attitude towards use	0.207	4.970	<.001	0.03
9	Entertainment value → Intrinsic enjoyment	0.730	48.047	<.001	1.14
10	Entertainment value → Perceived usefulness	0.356	14.794	<.001	0.12
11	Visual attractiveness → Attitude towards use	0.125	4.173	<.001	0.02
12	Visual attractiveness → Perceived ease of use	0.246	8.438	<.001	0.05

Table 2: PLS path coefficients, t-tests and effect sizes (n=1627).

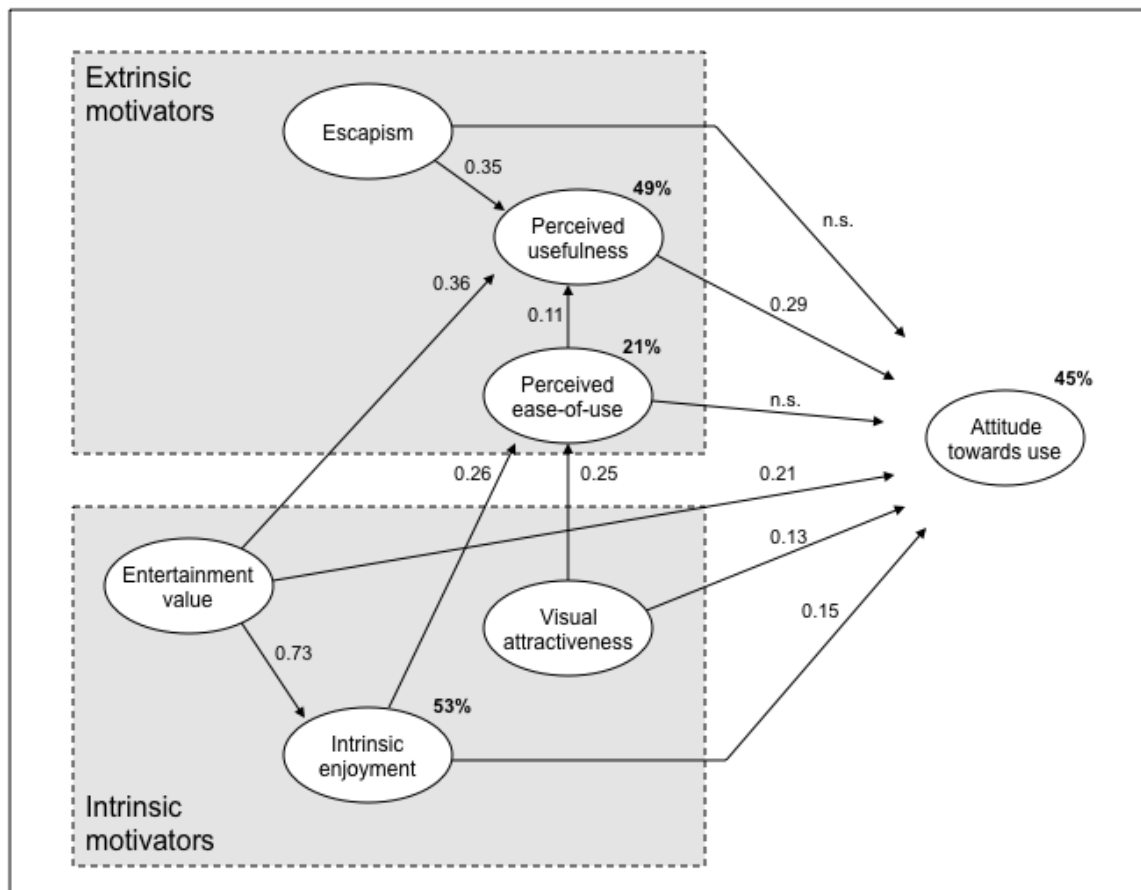


Figure 1: Results structural model. Note: all path coefficients are significant at  $p < .001$ .

Overall, the results strongly confirm the predictive power of the model. The amount of variance explained is high, implying a good fit to the data. The results indicate that ten hypotheses (H1, H3, H5,

H6, H7, H8, H9, H10, H11, H12) are supported and two (H2, H4) are rejected. Six significant paths are of substantial strength ( $>0.19$ ; cf. Chin, 1998b), while significant but smaller effects are reported for four paths.

## 6 DISCUSSION

### 6.1 Key Findings

Our research yields a number of key findings. First, the study reveals direct effects of the extrinsic belief perceived usefulness and the intrinsic beliefs intrinsic enjoyment, entertainment value and visual attractiveness on the attitude towards virtual world usage. Together, these concepts explained 45% of the attitude variance, which is quite impressive. Perceived usefulness and entertainment were the strongest predictors. The influences of intrinsic enjoyment and visual attractiveness were less strong. Overall, these findings confirm the proposed expansion of IT adoption drivers beyond general technology beliefs, and support the inclusion of intrinsic enjoyment, entertainment value and visual attractiveness. Second, our work provides strong support for the reinforcing role of intrinsic motivation on extrinsic motivation. We demonstrate that higher levels of enjoyment, entertainment, and visual attractiveness contribute to the perceived usefulness and perceived ease of use of virtual world systems. All proposed effects were significant and rather strong in nature. Adding to our first key finding, this finding suggests that intrinsic beliefs function as first- and second-order determinants of the attitude. Third, the results show that perceived usefulness mediates the effects of the extrinsic motives escapism and perceived ease of use on attitude. Contrasting our expectations, perceived ease of use and escapism did not directly relate to attitude. An explanation for the non-significance of perceived ease of use comes from literature claiming that ease of use solely affects behavior when a) users are inexperienced (Venkatesh, 2000) and/or b) the system is highly unusable (Van der Heijden and Verhagen, 2004). Since the vast majority of our respondents used Second Life on a regular base, these conditions are unlikely to apply to our research. Regarding the non-significance of escapism, we notice that, in line with the literature, its conceptualization reflects the instrumental value of a virtual world to achieve a particular goal (i.e., to 'escape'). As such, this task-specific behavioral belief reflects a perceived system benefit and is most likely to be used directly to form assessments about the general behavioral belief usefulness (Venkatesh and Davis, 2000; see also Ajzen and Fishbein, 1980), and not to judge about an overall disposition towards system use (i.e., the attitude).

### 6.2 Theoretical implications

This research is one of the first to understand the adoption of virtual worlds. We introduced and tested a model that integrates and extends existing models on utilitarian and hedonic system use. Given the fit of our model, our results seem to suggest that existing utilitarian and hedonic models fall short in explaining virtual world use. Our findings underline that user adoption of virtual worlds depends on two belief configurations, and support that extrinsic and intrinsic motives function simultaneously in adoption decision-making (cf. Engel et al., 1995). Future theoretical efforts could incorporate this evidence and test its applicability across different contexts.

To advance our understanding of the behavioral dynamics behind virtual world use, this study suggests two patterns concerning the consequences of intrinsic motivation. First, we challenged the claim to sufficiency of previous models such as TRA and TAM (cf. Venkatesh, 1999), and demonstrated that intrinsic motivation directly affects the attitude. Second, we showed that intrinsic motivation reinforces the effect of extrinsic motivation on attitude. Although this proposed order effect is theoretically plausible, and aligns with the fact that we included intrinsic motives to an existing base of extrinsic technology beliefs (and not vice versa; see also Venkatesh, 2000), this finding contrasts with previous IT adoption works showing that extrinsic motivation precedes intrinsic motivation (e.g.,

Davis et al., 1992; Van der Heijden, 2004). Apparently, the relationships between extrinsic and intrinsic motivation are more complex than initially thought and more research is needed.

### 6.3 Implications for practice

Our findings have several practical implications. First, our findings highlight the roles of intrinsic and extrinsic motivation as direct determinants of virtual world adoption. To directly affect adoption behavior, developers should enhance the usefulness, entertainment, enjoyment, and visual attractiveness of a given virtual world. As such, both productive and prolonged use can be triggered in a direct manner. Second, our research draws attention to the potential of integrating instrumental and enjoyable, new, challenging functions and features. The reinforcing influence of intrinsic motivation on extrinsic motivation guides such integration. For instance, employing features like attractive designs, funny navigation (e.g., flying; using cars, boats, planes), and entertaining video and sound can enhance usefulness and ease of use. Third, to further prioritize development efforts, our findings underline the vital function of perceived usefulness and entertainment value. Both constructs have strong direct effects on the attitude. Moreover, usefulness mediates the influence of ease of use and escapism on the attitude, and entertainment value has strong second-order effects via usefulness and intrinsic enjoyment. Being key influencers of virtual world adoption, a focus on both constructs and their determinants is likely to enhance the effectiveness of system development endeavors in the broader context of IS development in general.

### 6.4 Limitation and additional recommendation

The potential limitations of this study concern sample bias. While no evidence of nonresponse bias was found, self-selection effects caused by the use of a self-administered questionnaire cannot be completely ruled out. In addition, the sample of Dutch Second Life users implies external validation in Western culture. Scholars in the fields of information system research (e.g., Al-Gahtani, Hubona and Wang, 2007; Straub, Loch and Hill, 2001), however, have shown that cultural differences are likely to affect IT adoption. For example, in comparing collectivistic versus individualistic cultures Davis, Wang and Lindridge (2007) demonstrate that online consumers in collectivistic societies suppress the exploration and expression of emotions. In such settings, perceptions of pleasure can be assumed to have a relatively weak impact on online system use (Davis et al., 2007). Extrapolating this research finding to virtual world adoption, it is believable that the influence of intrinsic motivation is weaker in non-Western cultures. Future research may test this assumption by cross-validating our research across different cultures.

## 7 REFERENCES

- Adams, D.A., Nelson, R.R. and Todd P.A. (1992). Perceived usefulness, ease of use, and usage of information technology: A replication. *MIS Quarterly*, 16(2), 227-247.
- Ajzen, I. and Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*. Prentice Hall, Englewood Cliffs, New Jersey.
- Al-Gahtani., S.S., Hubona, G.S. and Wang, J. (2007). Information technology (IT) in Saudi Arabia: Culture and the acceptance and use of IT. *Information & Management*, 44(8), 681-691.
- Armstrong, J.S. and Overton, T. (1977). Estimating nonresponse bias in mail surveys. *Journal of Marketing Research*, 14(3), 396-402.
- Babin, B.J., Darden, W.R. and Griffin, M. (1994). Work and/or fun: Measuring hedonic and utilitarian shopping value. *Journal of Consumer Research*, 20(4), 91-99.
- Blalock, H.M. (1979). *Social Statistics*. Mc-Graw-Hill, New York.
- Bridges, E. and Florsheim, R. (2007). Hedonic and utilitarian shopping goals: The online experience. *Journal of Business Research*, 61(4), 309-314.

- Brown, S.A. and Venkatesh, V. (2005). Model of adoption of technology in households: A baseline model test and extension incorporating household life cycle. *MIS Quarterly*, 29(3), 399-426.
- Chin, W.W. (1995). Partial Least Squares is to LISREL as principal components analysis is to common factor analysis. *Technology Studies*, 2(2), 315-319.
- Chin, W.W. (1998a). The Partial Least Squares Approach to Structural Equation Modeling, in *Modern Methods for Business Research*, Marcoulides, G.A. (Ed.), Lawrence Erlbaum Associates, Mahway, New Jersey, 295-336.
- Chin, W.W. (1998b). Issues and opinion on structural equation modeling. *MIS Quarterly* 22(1), vii-xvi.
- Cyr, D., Head, M. and Ivanov, A. (2006). Design aesthetics leading to m-loyalty in mobile commerce. *Information & Management*, 43(8), 950-963.
- D'Ambra, J. and Rice, R.E. (2001). Emerging factors in user evaluation of the World Wide Web. *Information & Management*, 38(6), 373-84.
- Dabholkar, P.A. and Bagozzi, R.P. (2002). An attitudinal model of technology-based self-service: moderating effects of consumer traits and situational factors. *Journal of the Academy of Marketing Science*, 30(3), 184-201.
- Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-339.
- Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1992). Extrinsic and intrinsic motivation to use computers in the workspace. *Journal of Applied Social Psychology*, 22(14), 1111-1132.
- Davis, F.D. and Venkatesh, V. (1996). A critical assessment of potential measurement biases in the technology acceptance model: Three experiments. *International Journal of Human-Computer Studies*, 45(1), 19-45.
- Davis, L., Wang, S. and Lindridge, A. (2007). Cultural influence on emotional responses to on-line store atmospheric cues. *Journal of Business Research*, in press, corrected proof, 7.
- Deci, E.L. (1975). *Intrinsic Motivation*. Plenum Press, New York.
- Deci, E.L. and Ryan, R.M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. Plenum Press, New York.
- Deci, E.L. and Ryan, R.M. (1996). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227-268.
- Ducoffe, R.H. (1996). Advertising value and advertising on the web. *Journal of Advertising Research*, 36(5), 21-35.
- Engel, J.F., Blackwell, R.D. and Miniard, P.W. (1995). *Consumer Behavior*. The Dryden Press, Forth Worth, Texas.
- Fishbein, M. and Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior*. Addison Wesley, Reading, MA.
- Fornell, C. and Bookstein, F.L. (1982). Two structural equation models: LISREL and PLS applied to consumer exit-voice theory. *Journal of Marketing Research*, 19(November), 440-452.
- Henning, B. and Vorderer, P. (2001). Psychological escapism: Predicting the amount of television viewing by need for cognition. *Journal of Communication*, 51(1), 100-120.
- Hesterberg, T., Monaghan, S., Moore, D.S., Clipson, A. and Epstein, R. (2003). *Bootstrap Methods and Permutation Tests*. W.H. Freeman and Company, New York.
- Hirschman, E.C. (1983). Predictors of self-projection, fantasy fulfillment, and escapism. *Journal of Social Psychology*, 120(1), 63-76.
- Hirschman E.C. and Holbrook M.B. (1982). Hedonic consumption: Emerging concepts, methods and propositions. *Journal of Consumer Research*, 46(Summer), 92-101.
- Holbrook, M.B. and Hirschman, E.C. (1982a). The experiential aspects of consumption: Consumer fantasies, feelings, and fun. *Journal of Consumer Research*, 9(2), 132-140.
- Holbrook, M.B. and Hirschman, E.C. (1982b). Hedonic consumption: emerging methods and propositions. *Journal of Marketing*, 46(3), 92-101.
- Holbrook, M.B. (1986). Emotion in the Consumption Experience: Toward a New Model of the Human Consumer, in *The Role of Affect in Consumer Behavior: Emerging Theories and Applications*, Peterson, R.A., Hoyer, W.D. and Wilson, W.R. (Eds.). Heath, Lexington, MA, 17-52.

- Hong, S-J. and Tam, K.Y. (2006). Understanding the adoption of multipurpose information appliances: The case of mobile data services. *Information Systems Research*, 17(2), 162-179.
- Hong, S-L., Thong, J.Y.L. and Tam, K.Y. (2006). Understanding continued information technology usage behavior: A comparison of three models in the context of mobile internet. *Decision Support Systems* 42(3), 1810-1834.
- Hull, C.L. (1943). *Principles of Behavior: An Introduction to Behavior Theory*. Appleton-Century-Crofts, New York.
- Jayanti, R.K. and Burns, A.C. (1998). The antecedents of preventive health care behavior: An empirical study. *Journal of the Academy of Marketing Science*, 26(1), 6-15.
- Kim, H-Y. and Kim, Y-K. (2005). Escapism, consumer lock in, attitude, and purchase: an illustration from an online shopping context. *Journal of Shopping Center Research* 12(2), 103-115.
- Ko, D-G., Kirsch, L.J. and King, W.R. (2005). Antecedents of knowledge transfer from consultants to clients in enterprise system implementations. *MIS Quarterly*, 29(1), 59-85.
- Legris, P., Ingham, J. and Colletette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*, 40(3), 191-204.
- Lindgaard, G. and Dedek, C. (2003). What is the evasive beast we call user satisfaction? *Interacting with Computers*, 15 (3), 429-452.
- Mathwick, C., Malhotra, N. and Ridgon, E. (2001). Experiential value: Conceptualization, measurement and application in the catalog and internet shopping environment. *Journal of Retailing*, 77(1), 39-56.
- Moon, J-W. and Kim, Y-G. (2001). Extending the TAM for a world-wide-web context. *Information & Management*, 38(4), 217-230.
- Pavlou, P.A., Liang, H. and Xue, Y. (2007). Understanding and mitigating uncertainty in online exchange relationships: A principal-agent perspective. *MIS Quarterly*, 31(1), 105-136.
- Ping, R.A., Jr. (2004). On assuring valid measures for theoretical models using survey data. *Journal of Business Research*, 57(2), 125-141.
- Porter E.P. and Donthu, N. (2006). Using the Technology Acceptance Model to explain how attitudes determine internet usage: the role of perceived access barriers and demographics. *Journal of Business Research* 59(9), 999-1007.
- Richard, M-O. (2005). Modeling the impact of internet atmospherics on surfer behavior. *Journal of Business Research*, 58(12), 1632-1642.
- Ringle, C.M., Wende, S. and Will, S. (2005). *SmartPLS 2.0 (M3) Beta*. Hamburg, Germany. <http://www.smartpls.de>.
- Ryan, R.M. and Deci, E.L. (2000a). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78.
- Ryan, R.M. and Deci, E.L. (2000b). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54-67.
- Straub, D.W., Loch, K. and Hill, C. (2001). Transfer of information technology to the Arab world: A test of cultural influence modeling. *Journal of Global Information Management*, 9(4), 6-28.
- Tractinsky, N., Katz, A.S. and Ikar, D. (2000). What is beautiful is usable. *Interacting with Computers*, 13(2), 127-145.
- Van der Heijden, H. (2003). Factors influencing the usage of websites: The case of a generic portal in The Netherlands. *Information & Management*, 40(6), 541-549.
- Van der Heijden, H. (2004). User acceptance of hedonic information systems. *MIS Quarterly*, 28(4), 695-704.
- Van der Heijden, H. and Verhagen, T. (2004). Online store image: Conceptual foundations and empirical measurement. *Information & Management*, 41(5), 609-617.
- Venkatesh, V. (1999). Creation of favorable user perceptions: Exploring the role of intrinsic motivation. *MIS Quarterly*, 23(2), 239-260.
- Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research*, 11(4), 342-365.

- Venkatesh, V. and Davis, F.D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186-204.
- Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.
- Wakefield, R.L. and Whitten, D. (2006). Mobile computing: A user study on hedonic/utilitarian mobile device usage. *European Journal of Information Systems*, 15(3), 292-300.
- Wasko, M. M. and Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS Quarterly*, 29(1), 35-57.
- Xu, D.J., Liao, S.S. and Li, Q. (2008). Combining empirical experimentation and modeling techniques: A design research approach for personalized mobile advertising applications. *Decision Support Systems*, 44(3), 710-724.

## APPENDIX

\*\*\* = removed after EFA

**Perceived usefulness** (general) (Hong, Thong and Tam, 2006; Porter and Donthu, 2006; Van der Heijden, 2003). Mean (SD) = 3.17(1.466)

1. I find <name virtual world> useful in my life.
2. I find that <name virtual world> adds value to my life.
3. Overall, <name virtual world> is useful.
4. Using <name virtual world> helps me accomplish things more quickly.
5. Using <name virtual world> makes my life easier.
6. Using <name virtual world> can make one productive.\*\*\*
7. <Name virtual world> can make things easier. \*\*\*

**Perceived ease of use** (Hong et al., 2006; Porter and Donthu). Mean (SD) = 3.91 (1.628)

1. Learning how to use <name virtual world> is easy.
2. <name virtual world> is clear and understandable to use.
3. It is easy to become skilful at using <name virtual world>.
4. Overall, <name virtual world> is easy to use.

**Escapism** (Kim and Kim, 2005; Mathwick et al., 2001). Mean (SD) = 3.96 (1.617)

1. Using <name virtual world> makes me feel like I am in another world.
2. Using <name virtual world> “gets me away from it all”.
3. I get so involved when I use <name virtual world> that I forget everything else.
4. Using <name virtual world> truly feels like “an escape”.

**Intrinsic enjoyment** (Mathwick et al., 2001; Van der Heijden, 2003). Mean (SD) = 5.43 (1.263)

1. Irrespective of whether <name virtual world> gives me what I want, I enjoy using it for its own sake.\*\*\*
2. I use <name virtual world> for the pure enjoyment of it.
3. I use <name virtual world> for pleasure.
4. Using <name virtual world> is an agreeable way of passing time.

**Entertainment value** (Mathwick et al., 2001; Richard, 2005). Mean (SD) = 4.87 (1.426)

1. I think <name virtual world> is very entertaining.
2. The enthusiasm of <name virtual world> is catching, it picks me up.
3. Using <name virtual world> entertains me.
4. I think <name virtual world> is exciting. \*\*\*
5. I think <name virtual world> is imaginative.

**Visual attractiveness** (Mathwick et al., 2001; Van der Heijden, 2003). Mean (SD) = 4.92 (1.336)

1. The way things are displayed in <name virtual world> is attractive.
2. <name virtual world> is aesthetically appealing.
3. I like the way <name virtual world> looks.
4. Overall, I find that <name virtual world> looks attractive.

**Attitude** (Moon and Kim, 2001). Mean (SD) = 4.86 (1.183)

1. Using <name virtual world> is a good/bad idea.
2. Using <name virtual world> is a wise/foolish idea.
3. Using <name virtual world> is a pleasant/unpleasant idea.
4. Using <name virtual world> is a positive/negative idea.