RESEARCHING COGNITIVE ABSORPTION IN THE CONTEXT OF FUN-ORIENTED INFORMATION SYSTEMS USAGE: AN EXPLORATORY STUDY

Weniger, Sandra, University of Cologne, Department of Business, Media and Technology Management, Pohligstr. 1, 50969 Cologne, DE, sandra.weniger@uni-koeln.de

Loebbecke, Claudia, University of Cologne, Department of Business, Media and Technology Management, Pohligstr. 1, 50969 Cologne, DE, claudia.loebbecke@uni-koeln.de

Abstract

In this exploratory study, we investigate the role of cognitive absorption, a state of deep involvement with software, in the context of fun-oriented information systems (IS) usage. The construct of cognitive absorption has proven to be valuable for understanding the formation of user beliefs and intention to use. However, most prior studies which incorporate cognitive absorption, have focused on productivity-oriented IS usage in organizational or work-related settings. Paying tribute to the increase in fun-oriented IS usage, we develop a related research model for studying the formation of user beliefs that explicitly considers cognitive absorption. We evaluate the proposed variables and the research model based on empirically gathered Video on Demand (VoD) data. Our results indicate that cognitive absorption is affected by computer playfulness and a construct called perceived quality. Cognitive absorption, in turn, plays an important role in explaining perceived enjoyment. Contrary to our assumption, perceived enjoyment does not have a significant positive influence on the intention to use VoD repeatedly.

Keywords: Cognitive Absorption, Fun-Oriented / Hedonic IS Usage, Video on Demand

1 Introduction

One stream of research in information systems (IS) covers topics concerning the adoption and use of IS. It finds that user beliefs and intentions influence user behavior toward IS and shape the design and implementation of IS at the organizational, group, and individual level (Adams et al., 1992; Davis et al., 1989; Robey, 1979). However, so far research has paid scant attention to the antecedents of user beliefs (Benbasat and Barki, 2007). In 2000, Agarwal and Karahanna introduced a construct called 'cognitive absorption' and defined as "a state of deep involvement with software" (p. 673). The construct has been shown valuable for understanding the formation of user beliefs and intention to use, even if mainly in utilitarian (or productivity-oriented) organizational or work-related settings (e.g., Roca et al., 2009). Expanding the research scope, we expect that cognitive absorption determines the formation of user beliefs and intention to use also in the context of fun-oriented IS usage. Here, we aim to make a contribution. We develop and evaluate a research model for investigating the role of cognitive absorption in the context of fun-oriented IS usage. The remainder of the paper is structured as follows: We begin by describing the context of fun-oriented IS usage and explain why we look closely at the concept of cognitive absorption. We develop our research model and present our results regarding the role of cognitive absorption in the context of VoD usage. We close with a brief summary and discussion of our main findings.

2 Setting the Stage

2.1 Fun-oriented IS Usage as Research Context

With the term fun-oriented IS usage, we refer to predominantly pleasure-oriented or hedonic IS usage that is closely related to home and leisure activities. Such examples include watching TV and movies, playing video games, listening to music, and reading eBooks. The main purpose of fun-oriented IS usage is not about productivity or task performance, but about having a good time, a pleasant and valuable experience, passing time, or augmenting lifestyle (Turel et al., 2010). Fun-oriented IS usage often happens less planned ahead of time. In contrast to work-related IS usage, fun-oriented IS usage provides users with the discretion on selection, use, and continued use among similar systems. Thus, we characterize fun-oriented IS usage as mostly volitional. As opposed to using IS in organizational settings, the usage of fun-oriented IS is closely connected to individuals' buying decisions (Pavlou and Fygenson, 2006). Any buying decision is a reaction to a specific product – here IS – offering which is determined by decisions and strategies of the involved players. Consumers' usage preferences reflect such strategies, including product design and business model decisions.

In contrast to fun-oriented IS usage, with the term work-related IS usage we refer to mainly productivity-oriented or utilitarian usage that primarily occurs in organizational settings. In such contexts, IS are used as tools to accomplish tasks. Thus, they provide mainly instrumental value to the users. Examples for work-related IS usage are using office productivity tools on personal computers such as databases for managing customer data. Mostly, work-related IS usage is restricted by the organizational context, for instance, employees often only have limited choice of available IS depending on employer's offerings.

2.2 Cognitive Absorption in the Spotlight

The construct of cognitive absorption, defined as "a state of deep involvement with software" (Agarwal and Karahanna, 2000, p. 673), is supposed to contribute to a better understanding and explanation of the formation of user beliefs towards IS. Cognitive absorption has been found to be a proximal antecedent of the behavioral intention to use IT. The construct derives its foundations from

work in individual psychology and is exhibited through the five dimensions of (1) temporal dissociation, (2) focused immersion, (3) heightened enjoyment, (4) control, and (5) curiosity. Temporal dissociation is understood as the inability to register the passage of time while being engaged in interaction, while focused immersion derives from the experience of total engagement where other attentional demands are ignored. The dimension of heightened enjoyment captures the pleasurable aspects of the interaction, and control refers to the user's perception of being in charge with the interaction. Finally, curiosity describes the extent the experience arouses an individual's sensory and cognitive curiosity.

We suggest paying attention to cognitive absorption in the context of fun-oriented IS usage as it constitutes an intrinsic motivator (Agarwal and Karahanna, 2000). Intrinsically motivated activities are activities "for which there is no apparent reward except the activity itself" (Deci, 1975, p. 23). In this paper, intrinsic motivators play a decisive role because fun-oriented IS usage is mainly motivated by intrinsic rewards (Turel et al., 2010). Van der Heijden (2004, p. 697) notices that "for hedonic systems, we can expect intrinsic motivation to be the dominant predictor of intentions to use the system – at the expense of extrinsic motivation". However, only few studies focus on cognitive absorption in fun-oriented usage contexts (Chandra et al., 2009; Shang et al., 2005). So far, most studies have shown that cognitive absorption is valuable for understanding the formation of user beliefs and intention to use in work-related contexts (Roca et al., 2006; Saade and Bahli, 2005).

3 Research Model and Hypotheses

By paying attention to the characteristics of fun-oriented IS usage, we identify three main blocks of variables which influence the intention to use fun-oriented IS repeatedly. We choose the intention to use as dependent variable since prior research has shown that this variable constitutes a direct antecedent of the actual behavior (Fishbein and Ajzen, 1980; Davis, 1989). Moreover, nowadays nearly all people have used any kind of IS at least once and providers' revenue opportunities depend on the repeated use of IS, so that the question should be less about adopting or initiating use (Lyytinen, 2010) but more about how to foster repeated use.

3.1 Intrinsic Motivators

We include cognitive absorption and the two user beliefs perceived ease of use and perceived enjoyment as intrinsic motivators into our research model.

Intrinsic involvement plays a significant role in shaping users' perceptions of a system (Jackson et al., 1997). As such variable we incorporate cognitive absorption (Agarwal and Karahanna, 2000) referring to a user's state of deep involvement with a system. We model cognitive absorption with the dimensions 'temporal dissociation', 'focused immersion', 'control', and 'curiosity'.[1] With all of its dimensions, cognitive absorption affects perceived ease of use, i.e., "the degree to which an individual believes that using a particular system would be free of effort" (Davis, 1989, p. 320) and perceived enjoyment, i.e., "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" (Davis et al., 1992, p. 1113). Temporal dissociation contributes to perceived ease of use through conveying the impression that there is enough time to accomplish a task. Focused immersion and curiosity reduce the perceived cognitive burden associated with interacting with IS; thereby intensify the respective perceived ease of use. A sense of being in charge with the interaction (control) also contributes to the perceived ease of

1 Different from Agarwal and Karahanna (2000), who implicitly integrate perceived enjoyment in cognitive absorption, we follow Wakefield and Whitten (2006) that "combining enjoyment in cognitive absorption masks the variance unique to this affective construct" (p. 294) and distinguish between perceived enjoyment and cognitive absorption.

use by lowering the perceived difficulty in task performance (Agarwal and Karahanna, 2000). This leads to the first hypothesis:

H1. Cognitive absorption positively influences perceived ease of use.

An individual's perceptions of a lower cognitive burden (see H1) come along with experiencing pleasure (or enjoyment) from the activity (Agarwal and Karahanna, 2000), as Wakefield and Whitten, (2006) indicate, "when cognitive absorption is high, users indicate significantly greater enjoyment". We explain the positive relationship between cognitive absorption and the experience of enjoyment with the concept of cognitive dissonance, the uncomfortable state of mind caused by dissonant or non-fitting relations among cognitive elements (Festinger, 1962). During the state of cognitive absorption, a person who wonders why she uses the system rationalizes that 'it must be worth it', because she is spending time with it. As a result she attributes affective value to her behavior and perceives enjoyment. Thus, the next hypothesis is:

H2. Cognitive absorption positively influences perceived enjoyment.

The variables perceived ease of and perceived enjoyment derive their foundations from early technology acceptance research. Although prior researchers (Hong et al., 2002; Jackson et al., 1997; Lederer et al., 2000; Venkatesh, 1999) have applied the two variables and validated their positive influence on intention in mainly work-related contexts, we incorporate them into our research model since both variables represent intrinsic motivators (Davis et al., 1992). As stated above, intrinsic motivators are expected to be the most important predictors in the context of fun-oriented IS usage. We assume that both variables have a positive effect on the intention to use fun-oriented IS repeatedly, due to the fact that the easier and/or the more enjoyable a person perceives the IS usage, the more likely she tends to use the technology again.

As a result, the following two hypotheses arise:

H3. Perceived ease of use positively influences the intention to use repeatedly.

H4. Perceived enjoyment positively influences the intention to use repeatedly.

3.2 Personality Traits

We incorporate two personality traits into our model: Personal innovativeness in the domain of IT and computer playfulness, which directly relate to IS usage.

Personal innovativeness in the domain of IT captures "the willingness of an individual to try out a new information technology independent of the communicated experiences of others" according to Agarwal and Prasad (1996, p. 206). They understand personal innovativeness in the domain of IT as personal trait variable that has a positive effect on an individual's technology innovation adoption behavior. Individuals with a higher level of personal innovativeness develop more positive perceptions about the innovation and thus have more positive intentions toward using such IS. Agarwal and Karahanna (2000) and Jia et al. (2007) indicate that some dimensions of cognitive absorption are influenced by personal innovativeness in the domain of IT. Since most fun-oriented IS represent or come along with a relatively new technology, and a person who is more likely to experiment with new IS will tend to interact more spontaneously and curiously. She will tend to experience total involvement while her sense of time diminishes. Hence, we include personal innovativeness as antecedent of cognitive absorption, which leads to:

H5. Personal innovativeness in the domain of IT positively influences cognitive absorption.

Following Webster and Martocchio (1992, p. 204), the second personality trait, computer playfulness, refers to "the degree of cognitive spontaneity in microcomputer interactions". They explain that computer playfulness, on the one hand, constitutes an individual trait that is relatively invariant across situations, but on the other hand, can manifest itself as a state. We capture computer playfulness as a

trait variable. It refers to the predisposition to behave in certain ways across many situations, here, the stable way of interacting with IS. Prior research in mainly organizational settings has shown that playfulness has positive effects on flow, satisfaction, attitude towards computers, and their usage (Webster and Martocchio, 1992). Especially with regard to fun-oriented IS usage, we suppose the predisposition to interact spontaneously and inventively with IS to foster a users' temporal dissociation, to increase his focused immersion, and to enhance his feeling of curiosity and being in control while interacting with such IS. This results in:

H6. Computer playfulness positively influences cognitive absorption.

3.3 IS-Specific Factors

The consideration of IS-specific factors is important for understanding user behavior because user intentions depend on the products' nature (Lederer et al., 2000; Turel et al., 2010). For studying the repeated use of fun-oriented IS we capture such factors as quality dimensions and price; and incorporate them as the variables perceived quality and perceived price level into our research model.

Perceived quality captures the instrumental as well as the affective values that fun-oriented IS may provide. These days, "the form factors and functionalities of IS are no longer uniform" (Lyytinen, 2010, p. 23). Being shaped by the decisions of numerous providers and marketers, IS varies in terms of capabilities, features, and functions. In order to pay attention to the variety of fun-oriented IS the perceived quality construct encompasses four dimensions, which we will outline briefly:

- *Content quality* refers to the desired characteristics of the information product such as accuracy, meaningfulness, and timeliness. DeLone and McLean (1992) identify content quality, respectively information quality, as an important predictor for successful IS building. Subsequently, Lin and Lu (2000) notice the importance of perceived content quality for the intention to use IS, because content that is perceived as valuable and interesting, can stimulate the usage intention.
- *System quality* refers to IS attributes such as response time, system accessibility, reliability, and interoperability. Lin and Lu (2000) point to the importance of perceived system quality for the formation of user beliefs. While watching TV over the Internet, for example, frequent interruptions or delays in response let users perceive a low level of overall quality. Hence, users will be less likely to experience pleasure-oriented states like enjoyment.
- *Security* relates to users' security concerns that frequently accompany IS usage. For instance, Fang et al. (2005-2006) find that, under the mobile context, user intention to transact is influenced by perceived security. In the context of fun-oriented IS Shin (2009) highlights the direct effect of perceived security on their usage intention. Perceiving the use of fun-oriented IS as secure and safe contributes to overall perceived quality.
- *Interactivity* refers to a person's perception of an object's "potential ability to let a user exert an influence on the content and/or the form of the mediated communication" (Jensen, 1998, p. 201). McMillan and Hwang (2002) investigate the role of perceived interactivity in relation to users' attitudes towards websites and corresponding purchase decisions. As most fun-oriented IS offer interactivity features such as active control functions, the model incorporates perceived interactivity as dimension of perceived quality.

Our model captures perceived quality as determinant of the state of deep involvement, i.e., cognitive absorption. For instance, content that is perceived as valuable and interesting can stimulate the rise of curiosity, focused immersion, and loosing track of time and interactivity features can stimulate a user's feeling of being in control with the interaction. This leads to:

H7. Perceived quality positively influences cognitive absorption.

The second IS-specific variable forms *perceived price level*. Perceived price level reflects the fact that the price considerably influences the repeated use of fun-oriented IS (Lichtenstein et al., 1993; Pavlou and Fygenson, 2006). It directly links 'intention to use repeatedly' and buying and thus accommodates a difference between fun-oriented IS and IS mainly deployed in organizational settings. The use of

fun-oriented IS often requires users being willing to pay – directly for usage or access (e.g., pay-per-view, subscription) or indirectly via advertisement based business models (Pavlou and Fygenson, 2006). Any buying decision is a reaction to a specific product offering, which usually results from a provider's decisions regarding product design, business model, and pricing strategy. Many prior studies (Lichtenstein et al., 1993) state that the perceived price level inhibits the intention to use or buy a product or service. The perceived price level constitutes an obstacle for repeated use of fun-oriented IS. As a result, the following hypothesis arises:

H8. Perceived price level negatively influences the intention to use repeatedly.

Figure 1 shows the entire research model.

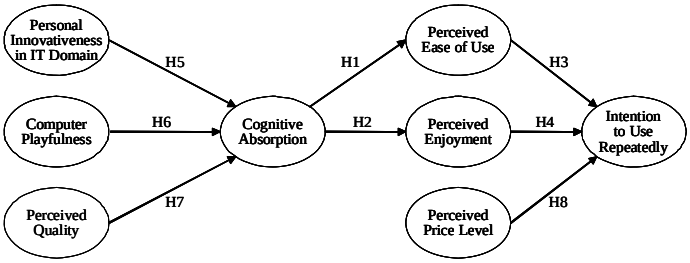

Figure 1. Research Model.

4 Research Methodology

4.1 Study Context and Sampling

To empirically estimate the research model we chose Video on Demand (VoD) as rather specific example for fun-oriented IS. By VoD, we mean a system that distributes professionally produced TV content – including television shows and full-length movies – on demand via the Internet (IP-based transmission). Hence, we do not focus on portals like YouTube which mainly provide user-generated content. We also exclude Internet Protocol Television (IPTV), which guarantees a certain quality of service. We conducted a field study using survey methodology. We developed an electronic, web-based questionnaire via a two-stage process. After finishing the survey construction, we pre-tested the survey and made some changes based to the pre-test feedback. Then we sent the survey link to the final version of the questionnaire via email to four different mailing lists (to members of an academic association and a student's union; to employees of a hospital and a car dealership). As we focus on the intention to repeatedly use VoD, we confined ourselves to survey only people with VoD experience. Hence, filter questions exclude participants without any VoD experiences. We operationalized all variables according to previously studied and validated measures. As our web-based questionnaire located on the Internet basically prevents random sampling, we built our model estimation on non-random, probabilistic sampling. The required minimum sample size follows the data analysis method. For applying partial least squares (PLS) for data analysis, the recommended minimal sample size is ten times the number of maximum arrowheads pointing on a latent variable (Gefen et al., 2000). In our model computer playfulness represents the most complex construct with eight items, leading to a required sample size of at least 80. The questionnaire was online for eight weeks in total (July-August 2010). The first page of the survey was accessed 171 time and 93 surveys were fully completed (offering complete data for all subjects). 43% of the respondents were male; 57% were female; all live in Germany.

4.2 Operationalization of Variables

All variables in our model are latent. To accommodate the characteristics of those latent variables, we operationalized them via item-based scales. We asked respondents to indicate their agreement with each statement in a measure using a five-point Likert-type scale with anchors 1 = strongly disagree and 5 = strongly agree. Scale items originate from previously studied and validated measures. We modified the wording of the items where necessary and included several reverse-coded items. Table 1 provides an overview of the variables and their dimensions.

Variable (Abbreviation)	Dimensions (Abbreviation)	Items	Source
Personal Innovativeness in the Domain of IT (PIIT)	-	4	Agarwal and Prasad (1996)
Computer Playfulness (CPS)	-	8	Webster and Martocchio (1992)
Cognitive Absorption (CA)	Temporal Dissociation (CA_TD)	5	Agarwal and Karahanna (2000)
	Focused Immersion (CA_FI)	5	Agarwal and Karahanna (2000)
	Control (CA_CO)	3	Agarwal and Karahanna (2000)
	Curiosity (CA_CU)	3	Agarwal and Karahanna (2000)
Perceived Quality (PQ)	Content Quality (PQ_CO)	3	Shin (2009)
	System Quality (PQ_SY)	3	Shin (2009)
	Security (PQ_SE)	3	Shin (2009)
	Interactivity (PQ_IN)	5	McMillan and Hwang (2002); Liu (2003)
Perceived Ease of Use (PEOU)	-	4	Davis (1989)
Perceived Enjoyment (PE)	-	4	Davis et al. (1992)
Perceived Price Level (PPL)	-	3	Liao and Cheung (2001)
Intention to Use Repeatedly (IU)	-	3	Ajzen and Fishbein (1980)

Table 1. Variables and their Dimensions.

4.3 Data Analysis

To validate the model, we chose partial least squares (PLS) as structural equation modeling (SEM) technique. PLS enables us to model the multiple relationships among multiple constructs (Chin, 1998; Gefen et al., 2000). We preferred PLS over covariance-based SEM tools because it allows modeling reflective and formative indicators (Chin, 1998) and our research model contains both. We modeled all constructs reflective except for perceived quality, which has formative indicators (dimensions). As software tools we used IBM SPSS Statistics 19 and SmartPLS 2.0 (Ringle et al., 2005).

5 Results

5.1 Measurement Model

We differentiated between the reflective or formative indicators (Jarvis et al., 2003) and conducted three steps to test the validity and reliability of the measurement model.

First, an *exploratory factor analysis* (rotation method: Promax with Kaiser Normalization) for cognitive absorption and perceived quality shows that all loadings are above 0.50; the majority above 0.70 (Table 2). This indicates adequate reliability of items (Fornell and Larcker, 1981). However, the cognitive absorption dimensions of temporal dissociation and curiosity load on the same factor (factor 1). The construct of perceived quality consists of four different dimensions; however the model estimation supports only three dimensions. The items referring to system quality and system security almost load on the same factor (factor 1). Content quality items relate to factor 2, whereas the items

for measuring interactivity load on factor 3. Even so, we decided to maintain the initial four-dimensional structure for subsequent analysis in order to gain primarily insights about the original (measurement and structural) model.

Item	Factor		
	1	2	3
CA_TD_1	0.859	0.601	0.531
CA_TD_2	0.856	0.552	
CA_TD_3	0.838	0.549	0.411
CA_TD_4	0.813	0.575	0.440
CA_CU_1	0.811	0.545	0.468
CA_CU_2	0.783	0.440	0.487
CA_CU_3	0.778	0.679	0.620
CA_TD_5	0.680	0.604	0.576
CA_FI_1	0.670	0.822	0.479
CA_FI_2	0.481	0.816	
CA_FI_3	0.756	0.800	0.549
CA_FI_4	0.507	0.774	0.433
CA_FI_5	0.433	0.670	
CA_CO_1	0.495	0.422	0.901
CA_CO_2		0.497	0.615
CA_CO_3			0.510

Item	Factor		
	1	2	3
PQ_SY_1	0.893	0.586	0.420
PQ_SE_1	0.849	0.494	
PQ_SE_2	0.784		
PQ_SY_2	0.756	0.576	0.502
PQ_IN_1	0.752	0.523	0.663
PQ_SE_3	0.748	0.626	0.659
PQ_IN_2	0.728	0.545	0.496
PQ_CO_1	0.448	0.781	0.468
PQ_SY_3	0.605	0.757	0.561
PQ_CO_2	0.489	0.745	0.497
PQ_CO_3		0.617	
PQ_IN_3	0.449	0.521	0.806
PQ_IN_4			0.797
PQ_IN_5			0.509

Note: Suppress absolute values <0.3.

Table 2. Factor Structure of Factor Analysis for Cognitive Absorption and Perceived Quality.

Concerning the *reflective measurement quality*, PLS analysis shows that each item's loadings on its corresponding construct are above 0.50. However, the loadings of four items (CA_CO_2, PQ_IN_5, PE_4, and PEOU_1) are below 0.70. A rule of thumb suggests that the item loading should exceed 0.70, but 0.50 is also acceptable for new applications or situations when other items measuring the same construct have high reliability scores (Chin, 1998). All items show a Cronbach's alpha of at least 0.60, the majority above 0.80; and an average variance extracted (AVE) of at least 0.50, the majority above 0.60. Generally, for Cronbach's alpha a level of 0.70 is considered as acceptable to assign reliability (Hulland, 1999). However, due to the early stage of research we regarded 0.60 to 0.50 as a benchmark for 'modest' internal consistency reliability (Nunnally, 1967). Concerning the average variance extracted, we followed Fornell and Larcker (1981) by regarding a level of 0.50 as sufficient. Table 3 shows that scales used in this study largely meet these guidelines.

Results indicate that the loading of all items on its assigned latent variable are higher than its loadings on all other latent variables. To ensure discriminant validity, it is expected that each block of items load higher for its respective latent variable than items for other latent variables (Fornell and Larcker, 1981). Some items such as PQ_SE_1 and PQ_IN_1 also exhibit high loadings (>0.70) on other latent variables, but these belong to the same higher construct, here perceived quality. In terms of convergent validity, results show all constructs having a composite reliability above 0.80 (see Table 3). The critical threshold for the composite reliability scores is a level of 0.70 (Hulland, 1999).

Regarding the *formative measurement quality*, Table 4 shows PLS bootstrapping results, indicating that all constructs have satisfactory indicator loading except PQ_CO, which is 0.59. All loadings are significant at the 0.05 level. With regard to rule out multicollinearity, the assessment of the variance inflation factor (VIF) and the tolerance (Tol) shows that all respective values are within the required range. To rule out multicollinearity, one should accept indicators with a VIF of ten or below and a Tol of 0.1 or higher (Diamantopoulos and Winklhofer, 2001). Table 5 shows that the respective values are all within the required range.

Indicator	AVE	Composite Reliability	Cronbach's Alpha	Commu-nality
PIIT	0.669	0.854	0.772	0.669
CPS	0.624	0.930	0.913	0.624
CA	0.516	0.943	0.933	0.516
CA_CO	0.602	0.817	0.675	0.602
CA_CU	0.827	0.935	0.895	0.827
CA_FI	0.682	0.914	0.883	0.682
CA_TD	0.756	0.939	0.919	0.756
PEOU	0.620	0.866	0.810	0.620
PE	0.645	0.875	0.811	0.645
PPL	0.817	0.930	0.886	0.817
IU	0.837	0.939	0.903	0.837

Table 3. Quality Criteria Overview.

Indicator	Original Sample	Sample Mean	Std. Dev.	Std. Error	T-Stat
PQ_CO → PQ	0.595	0.595	0.087	0.087	6.819
PQ_SY → PQ	0.767	0.766	0.063	0.063	12.180
PQ_SE → PQ	0.865	0.857	0.038	0.038	22.821
PQ_IN → PQ	0.916	0.907	0.031	0.031	29.718

Table 4. PLS Bootstrapping Results: Outer Loadings.

Indicator	Tol	VIF
PQ_CO	0.605	1.652
PQ_SY	0.307	3.255
PQ_SE	0.427	2.342
PQ_IN	0.486	2.059

Table 5. Collinearity Statistics.

5.2 Structural Model

Figure 2 shows the result of the structural model in terms of the coefficient of determination (R Square) for the endogenous latent variables, the sign of the path and the path coefficients (Chin, 1998).

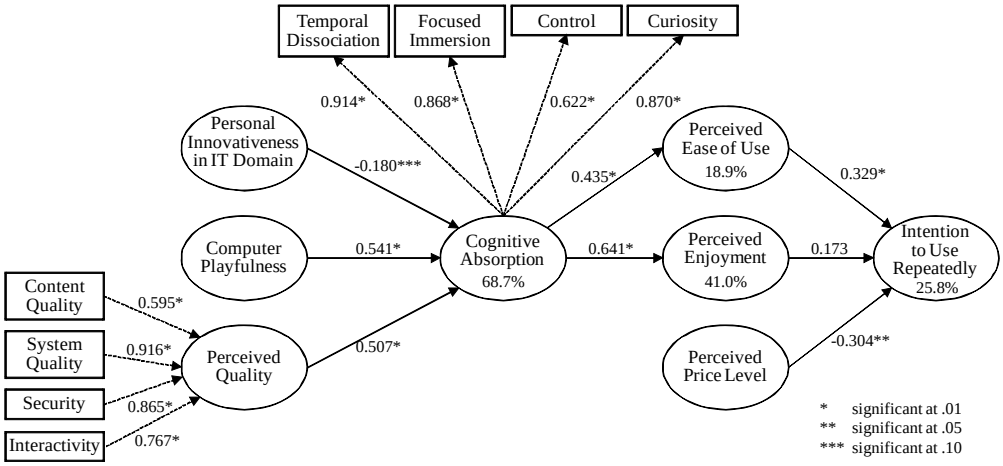

Figure 2. PLS Results: Path Coefficients and R Squares.

Perceived quality, personal innovativeness, and computer playfulness explain 68.7% of the variance in cognitive absorption. Cognitive absorption accounts for 18.9% of the variance in perceived ease of use and 41.0% of the variance in perceived enjoyment. Perceived ease of use, perceived enjoyment, and perceived price level explain 25.8% in the intention to use VoD repeatedly.

Most of the determined path coefficients are above the recommended level of 0.30 for being considered meaningful (Chin, 1998). T- and p-values show that all hypothesized relationships are significant (see Figure 2), except for the relationship between perceived enjoyment and intention to use repeatedly (p-value = 0.227).

Hence, PLS results provide support for hypothesis H1 and H2; that is, in the context of hedonic IS usage cognitive absorption positively influences perceived ease of use and perceived enjoyment. Results also support H3, indicating that perceived ease of use positively influences the intention to repeatedly use VoD. Contrary to our predictions, perceived enjoyment only has a weak (insignificant) influence on the intention to use VoD repeatedly. Thus, results do not support H4. Due to the wrong sign of the path, results also do not confirm H5, which posited that personal innovativeness in the domain of IT would positively influence cognitive absorption. Computer playfulness and perceived quality, however, have a positive influence on cognitive absorption, thus supporting H6 and H7. Results confirm H8; there is a significant negative influence of the perceived price level on the intention to use VoD repeatedly.

6 Summary of Findings and Discussion

In summary, with our study we find with regard to fun-oriented IS usage that,

(1) Cognitive absorption positively influences perceived ease of use and perceived enjoyment,
(2) Users' perceived enjoyment barely influence users' intention to use fun-oriented IS repeatedly,
(3) Personal innovativeness does not positively influence users' state of cognitive absorption,
(4) Users' perceptions of quality considerably influence users' cognitive absorption,
(5) The 'higher' the perceived price of usage, the less likely users tend to use the system again.

We observe that users, who are more cognitively absorbed with fun-oriented IS, perceive greater ease of use and experience higher enjoyment while using the IS. Thus, we confirm cognitive absorption as important determinant of intrinsic motivators in the context of fun-oriented IS usage.

Different from Turel et al. (2010) and van der Heijden (2004), who find evidence that intrinsic motivators are important predictors of intention to use, we find an insignificant relationship between perceived enjoyment and intention to use fun-oriented IS repeatedly. We may explain this by perceived enjoyment not being relevant in the context of a technology such as VoD, as VoD usage may provide less hedonic outcomes such as enjoyment in favor of providing diversion and 'useful' information to pass the time (van der Heijden, 2004).

Different from Agarwal and Karahanna (2000), we show that personal innovativeness in the domain of IT significantly influences cognitive absorption. This may be explained by the nature of VoD, which resembles traditional TV ('lean back' medium) more than the Internet ('lean forward' medium). As VoD does not provide many possibilities for experimentation, selection, and interaction, users with a distinct trait of personal innovativeness are not more likely to experience a 'state of deep involvement'.

Extending Agarwal and Karahanna (2000) who acknowledge the need to include characteristics of the technology that make the technology more or less prone to cause cognitive absorption, we underline perceived quality as important determinant of cognitive absorption. The 'better' users assess fun-oriented IS in terms of content quality, system quality, security, and interactivity, the 'easier' they become cognitively absorbed.

Finally, similar to Pavlou and Fygenson (2006), we find a significant negative influence of the perceived price level on the intention to use. Thereupon, we encourage positioning cognitive absorption within the relationships of personality traits, intrinsic motivators, and IS-specific factors.

We admit that – in addition to the low number of respondents and the disputable representativeness of the sample – two research design issues limit the generalizability of our findings. Firstly, we took a generally accepted understanding of the term VoD as granted. However, we may need to more

precisely differentiate between the technical system and the content VoD provides. Secondly, we only validate our model based on VoD data, whereas investigating a broader set of fun-oriented IS would foster generalizability. However, also single IS investigations contribute to the understanding of user behavior towards IS (see also Lederer et al., 2000 and Roca et al., 2006). So we hope that our pilot data encourages future research as and thus contributes to develop theoretically grounded insights to a better understanding of the role of cognitive absorption in the context of fun-oriented IS usage.

References

Adams, D., Nelson, R. and Todd, P. (1992). Perceived Usefulness, Ease of Use, and Usage of Information Technology: A Replication. MIS Quarterly, 16 (2), 227-247.

Agarwal, R. and Karahanna, E. (2000). Time Flies When You're Having Fun: Cognitive Absorption and Beliefs about Information Technology Usage. MIS Quarterly, 24 (4), 665-694.

Agarwal, R. and Prasad, J. (1996). A Conceptual and Operational Definition of Personal Innovativeness in the Domain of IT. Information Systems Research, 9 (2), 204-215.

Ajzen, I. and M. Fishbein (1980). Understanding Attitudes and Predicting Social Behavior. Prentice-Hall, Englewood Cliffs.

Bhattacherjee, A. (2001). Understanding Information Systems Continuance: An Expectation-Confirmation Model, MIS Quarterly, 25 (3), 351-370.

Benbasat, I. and Barki, H. (2007). Quo Vadis TAM. Journal of the Association for Information Systems, 8 (4), 211-218.

Chandra, S., Srivastava, S. and Theng, Y. (2009). Role of Cognitive Absorption and Trust for Collaboration in Virtual World. In Proceedings of the Pacific Asia Conference on Information Systems (PACIS) 2009, aisel.aisnet.org/pacis2009/82/, accessed on 2010-11-02.

Chin, W. (1998). Issues and Opinion on Structural Equation Modeling. MIS Quarterly, 22 (1), vii-xvi.

Davis, F. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly, 13 (3), 318-339.

Davis, F., Bagozzi, R. and Warshaw, P. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. Management Science, 35 (8), 982-1003.

Davis, F., Bagozzi, R. and Warshaw, P. (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace. Journal of Applied Social Psychology, 22 (14), 1111-1132.

Deci, E. (1975). Intrinsic Motivation. Plenum Press, New York, London.

DeLone, W. and Mc Lean, E. (1992). Information Systems Success: the Quest for the Dependent Variable, Information Systems Research, 3 (1), 60-95.

Diamantopoulos, A. and Winklhofer, H. (2001). Index Construction with Formative Indicators: An Alternative to Scale Development. Journal of Marketing Research, 38 (2), 269-277.

Fang, X., Chan, S., Brzezinski, J. and Xu, S. (2005-2006). Moderating Effects of Task Type on Wireless Technology Acceptance. Journal of Management Information Systems, 22 (3), 123-157.

Festinger, L. (1962). A Theory of Cognitive Dissonance. Stanford University Press, Stanford.

Fornell, C. and Bookstein, F. (1982). Two Structural Equation Models: LISREL and PLS Applied to Consumer Exit-Voice Theory. Journal of Marketing Research, 19 (4), 440-452.

Gefen, D., Straub, D. and Boudreau, M. (2000). Structural Equation Modeling and Regression: Guidelines for Research Practice. Communications of the AIS, 4 (Article 7), 1-79.

Hong, W., Thong, J., Wong, W. and Tam, K. (2002). Determinants of User Acceptance of Digital Libraries: An Empirical Examination of Individual Differences and System Characteristics. Journal of Management Information Systems, 18 (3), 97-124.

Hulland, J. (1999). Use of Partial Least Squares (PLS) in Strategic Management Research: A Review of Four Recent Studies. Strategic Management Journal, 20 (2), 195-204.

Jackson, C., Chow, S. and Leitch, R. (1997). Toward an Understanding of the Behavioral Intention to Use an Information System. Decision Sciences, 28 (2), 357-389.

Jarvis, C., Mackenzie, S. and Podsakoff, P. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. Journal of Consumer Research, 30 (2), 199-218.
Jensen, J. (1998). Interactivity - Tracking a New Concept in Media and Communication Studies. Nordicom Review, 19 (1), 185-204.
Jia, R., Hartke-Jia, H., Pearson, J. (2007). Can Computer Playfulness and Cognitive Absorption Lead to Problematic Technology Usage?, Proceedings of the 28th International Conference on Information Systems (ICIS) 2007.
Lederer, A., Maupin, D., Sena, M. and Zhuang, Y. (2000). The Technology Acceptance Model and the World Wide Web. Decision Support Systems, 29 (3), 275-282.
Lichtenstein, D., Ridgway, N. and Netemeyer, R. (1993). Price Perceptions and Consumer Shopping Behavior: A Field Study. Journal of Marketing Research, 30 (2), 234-245.
Lin, J. and Lu, H. (2000). Towards an Understanding of the Behavioral Intention to Use a Web Site. International Journal of Information Management, 20 (3), 197-208.
Liu, Y. (2003). Developing a Scale to Measure the Interactivity of Websites. Journal of Advertising Research, 43 (3), 207-216.
Liao, Z. and Cheung, M. (2001). Internet-based E-shopping and Consumer Attitudes: An Empirical Study. Information and Management, 38 (5), 299-306.
Lyytinen, K. (2010). Human-Computer Interaction Research: Future Directions that Matter. AIS Transactions on Human-Computer Interaction, 2 (2), 22-25.
McMillan, S. and Hwang, J. (2002). Measures of Perceived Interactivity: An Exploration of the Role of Direction of Communication, User Control, and Time in Shaping Perceptions of Interactivity. Journal of Advertising, 31 (3), 29-42.
Nunnally, J. (1967). Psychometric Theory. McGraw-Hill, New York.
Pavlou, P. and Fygenson, M. (2006). Understanding and Predicting Electronic Commerce Adoption: An Extension of the Theory of Planned Behavior. MIS Quarterly, 30 (1), 115-143.
Ringle, C., Wende, S. and Will, A. (2005). SmartPLS 2.0 (beta), www.smartpls.de, Hamburg.
Robey, D. (1992). User Attitudes and Management Information System Use. The Academy of Management Journal, 22 (3), 527-538.
Roca, J., Chiu, C., and Martinez, F. (2006). Understanding E-Learning Continuance Intention: An Extension of the Technology Acceptance Model. International Journal of Human Computer Studies, 64 (8), 683-696.
Saade, R. and Bahli, B. (2005). The Impact of Cognitive Absorption on Perceived Usefulness and Perceived Ease of Use in On-Line Learning: An Extension of the Technology Acceptance Model. Information and Management, 42 (2), 317-327.
Shang, R., Chen, Y. and Shen, L. (2005). Extrinsic versus Intrinsic Motivations for Consumers to Shop On-Line. Information and Management, 42 (3), 401-413.
Shin, D. (2009). An Empirical Investigation of a Modified Technology Acceptance Model of IPTV. Behavior and Information Technology, 28 (4), 361-372.
Turel, O., Serenko, A. and Bontis, N. (2010). User Acceptance of Hedonic Digital Artifacts: A Theory of Consumption Values Perspective. Information and Management, 47 (1), 53-59.
Van der Heijden, H. (2004). User Acceptance of Hedonic Information Systems. MIS Quarterly, 28 (4), 695-704.
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.
Wakefield, R. and Whitten, D. (2006). Mobile Computing: A User Study on Hedonic/Utilitarian Mobile Device Usage. European Journal of Information Systems, 15 (3), 292-300.
Webster, J. and Martocchio, J. (1992). Microcomputer Playfulness: Development of a Measure with Workplace Implications. MIS Quarterly, 16 (2), 201-226.