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Shirish C. Srivastava

Operations Management and Information Technology Department, HEC Paris, France., srivastava@hec.fr

Shalini Chandra

Wee Kim Wee School of Communication and Information, Nanyang Technological University, SHAL0005@ntu.edu.sg

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Examining Utilitarian and Hedonic Factors and their Moderators for Virtual World Collaborations

Shirish C. Srivastava

Operations Management and Information
Technology Department, HEC Paris,
France.
srivastava@hec.fr

Shalini Chandra

Wee Kim Wee School of Communication and
Information, Nanyang Technological University,
Singapore.
shal0005@ntu.edu.sg

ABSTRACT

Although experts sense a big future for virtual worlds (VWs) in the workplace scenario, their use in the business world is still in a nascent stage. A key challenge for organizations is to motivate users for utilizing VW for workplace related tasks. This research investigates the behavioral intention (BI) to use VW as a workplace 'collaboration tool'. The model, grounded in literature on 'motivations' and 'task success characteristics', not only examines the direct effects of 'utilitarian' and 'hedonic' factors on VW usage intentions but also the moderating role of 'familiarity' and 'control'. Results suggest a salient role of 'utilitarian' as compared to 'hedonic' factors and demonstrate the importance of considering the moderating effects of 'familiarity' and 'control' in determining the intention to use VW for collaborations. Implications for research and practice are also discussed.

Keywords

Virtual world, utilitarian, hedonic, usefulness, compatibility, enjoyment, curiosity, control, familiarity, task success

INTRODUCTION

Despite the expected benefits from virtual world (VW) implementations, the number of failures of such implementations is increasing. Many companies that made a strong entrance into VW during the first wave of creating virtual presence are now stepping back. Even in the face of a high failure rate, experts sense a big future of VW for workplace collaborations and compare the current problems in VW to the challenges faced by the web in 1990s. A study attributes 90 percent of business failure in VW to an extra emphasis on 'technology' by implementers rather than understanding the demographics, behaviors and expectations of the VW communities (Gonsalves, 2008). Hence there is an imperative need to research on the behavioral aspects of VWs which can motivate users to fruitfully utilize VWs for workplace collaboration. In line with these objectives, we examine the 'motivations' for using VW as a workplace 'collaboration tool'.

Consumer behavior literature clearly distinguishes between 'utilitarian' and 'hedonic' factors for using systems and services (Babin et al., 1994; Holbrook and Hirschman 1982; van der Heijden, 2006). An understanding of specific 'utilitarian' and 'hedonic' usage motivations are therefore crucial in assisting organizations to effectively strategize their resources for fostering favorable usage intentions. Viewing the usage intention motivations from 'utilitarian' versus 'hedonic' perspectives, the study contributes to the emerging but limited body of research on behavioral intention (BI) to use VW for workplace collaborations by addressing two critical issues.

First, theorizing user motivations, we propose a direct effects model of 'utilitarian' and 'hedonic' motivators, illustrating the range of possible expected benefits associated with the use of this immersive platform as a collaborative tool. This conceptualization emphasizes the need to incorporate context-specific factors for predicting user motivations (Kleijnen et al., 2007).

Second, describing a causal link between behaviors and outcomes Langer (1975) stated that user behavior is often guided by the perceptions of success in complex tasks. Thus focusing on direct relationships alone for explaining the BI to use VW may inhibit a more comprehensive understanding of user reactions to such systems (Kleijnen et al, 2007). Hence, we examine the moderating role of task success characteristics like 'control' and 'familiarity' for using VW as a 'collaboration tool' (Kahai et al., 1998; Triplet and Cohn, 1984).

The two specific research questions that we address in this study are:

- Are ‘utilitarian factors’ and/or ‘hedonic factors’ significant drivers for behavioral intention to use VW as a workplace collaborative medium?
- Do task success characteristics of ‘familiarity’ and ‘control’ moderate the relationship between ‘user’s motivational factors’ and ‘user’s intention to use’ the VW for workplace collaborations?

THEORY AND HYPOTHESES

We attempt to answer the above mentioned research questions by integrating the literature on ‘motivations’ with ‘task success characteristics’. The paper theoretically develops and empirically validates a research model that explains the role of utilitarian motives of ‘usefulness’ and ‘compatibility’ together with hedonic motives of ‘enjoyment’ and ‘curiosity’ in determining BI to use VW for collaborations. Further, the study examines the moderating influence of task success characteristics of ‘familiarity’ and ‘control’ on these relationships as exhibited in Figure1.

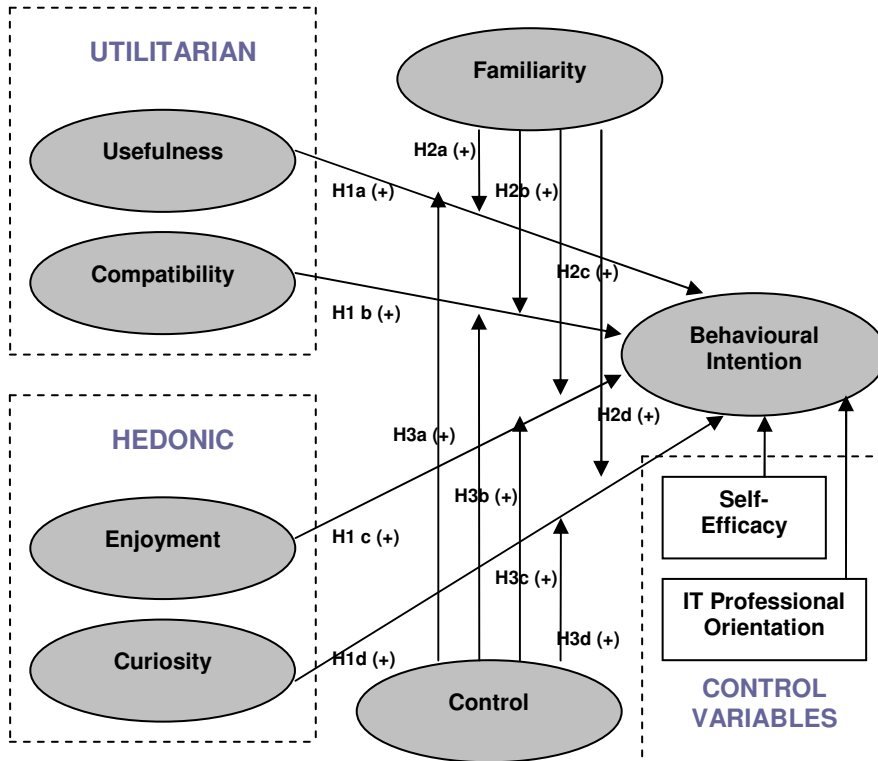


FIGURE 1. Research Model

Two Types of Motivations

Collaborations through VW can be perceived as the users’ acceptance of VW as a means to discuss and share ideas and information. Users need to be motivated to develop the BI to use VW for collaborations. Motivation is an attribute that explains the behavior of individuals to use or not use a new technology. Two fundamental types of motivations playing an important role in user acceptance are extrinsic and intrinsic motivations (van der Heijden, 2004). Extrinsic motives are defined as motivations to perform an activity for the external benefits or rewards. Intrinsic motives, on the other hand, refer to no apparent instrumental reason for performing the activity other than the benefits derived from performing the activity alone (Teo et al., 1999). This is in consonance with the consumer behavior literature that clearly describes consumers’ evaluations of shopping experience along two broad dimensions viz. utilitarian and hedonic (Babin et al., 1994; Holbrook and Hirschman 1982). Similarly in the context of IS, utilitarian motives aim at providing ‘instrumental value’ to the users e.g. economic gains, task completion, performance etc., whereas hedonic motives (derived from the word hedonism) relate to providing ‘self-fulfilling value’ to the users e.g. pleasure, stimulation, enjoyment (Van der Heijden, 2004).

Utilitarian Motives for Using Virtual Worlds: Usefulness and Compatibility

The utilitarian objective of using an IS is to use the system in an efficient and timely manner so as to achieve the desired goals and fulfill certain extrinsic motives (Childers et al., 2001). Perceptions of usefulness are the extent to which one believes that using a system will enhance his/her performance (Davis 1989). The association between perceived usefulness

and BI to use information systems has been empirically validated by several studies (Davis et al., 1989; Venkatesh and Davis, 2000). VW offers several benefits to its users like enhanced interactivity, information sharing and collaboration among users. This leads us to expect that users will use VW for collaboration if they perceive VW would help them achieve better performance levels. In this context, we propose the following hypothesis,

H1a: Perceived usefulness of the virtual world is positively associated with the behavioral intention to use virtual worlds for collaborations.

In addition to usefulness for the task at hand users also derive utilitarian value by using a particular technology if it is compatible with users' ideas, habits, experiences, beliefs and expectations. Hence, technology should not only be serving the specific task but should also be attuned to broader utilitarian objectives of the user (O'Cass and Fenech, 2003). In the case of VW, technology can provide utilitarian value to the user not only by serving as an alternative tool for virtual collaborations in the workplace but also by helping the users achieve their goals efficiently and timely (Childers et al., 2001). Past research has demonstrated the obvious choice of the users for the products that are compatible with individuals' goal orientation (Chernev, 2004). Thus compatibility of the technology with the individuals' goal orientation, lifestyle, habits and experiences also describes the utility of the VW for the user. Extrapolating from this discussion, we posit 'compatibility' as a utilitarian motive in addition to 'usefulness'. VW would be a convenient tool for collaboration if it matches the present collaboration and technology habits, beliefs and ideas of the users. Hence, we hypothesize,

H1b: Compatibility of the virtual world is positively associated with the behavioral intention to use virtual worlds for collaborations.

Hedonic Motives for Using Virtual Worlds: Enjoyment and Curiosity

In contrast to utilitarian objectives, hedonic objectives for using an IS is the degree to which the user experiences fun, enjoyment and stimulation while using the system, thereby deriving intrinsic happiness and pleasure (van der Heijden, 2004). In order to obtain a pleasurable experience, users often seek sensations on multiple sensory channels (Holbrook and Hirschman 1982; van der Heijden, 2004). VW with 3-D immersive features of rich graphical interface and visual and aural cues are supposedly fun-filled platforms. Hence, we expect the hedonic factors of 'enjoyment' and 'curiosity' to play a significant role in determining the BI in the context of VW.

Perceptions of enjoyment is an intrinsic motivation variable that has shown a significant direct influence on an individual's BI to use new technologies and information systems (Childers et al., 2001; van der Heijden, 2004). We expect that when a user perceives that serious tasks like collaboration, information sharing and other business activities can be a fun-filled and enjoyable experience, s/he would be willing to adopt this new technology for collaborative tasks. Thus, we hypothesize,

H1c: Perceived enjoyment in using virtual world is positively associated with behavioral intention to use virtual worlds for collaborations.

VW are fun-filled, highly interactive and immersive platforms offering pleasurable experience to users, thereby arousing the individual's sensory and cognitive curiosity (Malone, 1981). This curiosity is amplified when interaction with a specific system invokes excitement about the available possibilities (Webster et al. 1993). This amplified curiosity or excitement reduces the perceived cognitive burden associated with the usage of this technology thereby cutting down the perceived difficulty in performing the task at hand (Webster et al., 1993). Thus, we hypothesize,

H1d: Curiosity in using virtual world is positively associated with behavioral intention to use virtual worlds for collaborations.

Moderators: Task Success Characteristics of 'Familiarity' and 'Control'

User behavior is guided by the perceptions of success in complex tasks (Langer, 1975). Expectancy theory of motivation (Vroom et al., 1968) also explains that behavioral decision by users is contingent upon the expected outcomes or perceptions of task success. Thus, the perceptions of success in complex tasks are critical features in explaining the user behavior. Past research has demonstrated the influence of task characteristics like 'familiarity' and 'control' for eventual success (Kahai et al., 1998; Triplet and Cohn, 1984). Feather (1969) suggested that users who perceive control over complex tasks develop the confidence to succeed in them relatively easily. In fact, some researchers have explained the significance of situational factor like familiarity in developing illusions of control (Langer, 1975). Realizing the significance of the task success characteristics of 'familiarity' and 'control' for developing perceptions of expected outcomes and consequent BI for using VW, we expect the relationships of utilitarian and hedonic motives with BI to be moderated by task success characteristics of 'familiarity' and 'control'. Hence, we hypothesize,

H2a: Higher the user's familiarity with VW, higher will be the effect of usefulness on the BI to use virtual world for workplace collaborations.

H2b: Higher the user's familiarity with VW, higher will be the effect of compatibility on the BI to use virtual world for workplace collaborations.

H2c: Higher the user's familiarity with VW, higher will be the effect of enjoyment on the BI to use virtual world for workplace collaborations.

H2d: Higher the user's familiarity with VW, higher will be the effect of curiosity on the BI to use virtual world for workplace collaborations.

H3a: Higher the user's perceptions of control on VW, higher will be the effect of usefulness on the BI to use virtual world for workplace collaborations.

H3b: Higher the user's perceptions of control on VW, higher will be the effect of compatibility on the BI to use virtual world for workplace collaborations.

H3c: Higher the user's perceptions of control on VW, higher will be the effect of enjoyment on the BI to use virtual world for workplace collaborations.

H3d: Higher the user's perceptions of control on VW, higher will be the effect of curiosity on the BI to use virtual world for workplace collaborations.

RESEARCH METHOD, DATA AND ANALYSES

Survey method was used to collect data for testing the research hypotheses as it enhances the generalizability of results (Dooley, 2001). A survey instrument (on a 7-point Likert scale) was first developed by identifying and adapting appropriate measures from the existing literature to the case of VW, thereby ensuring content validity. The designed questionnaire was pilot-tested with three research students before being used for final survey.

The sampling frame for this study comprised of 'VW users who use VW for recreational activities'. For conducting the survey, the first step was to pre-screen users of VW who had prior experience of VW for recreational activities. Using these criteria we distributed paper-based survey questionnaires to more than 300 part time and full time students in two large university campuses in Singapore. Subsequently, we had responses from 226 respondents out of which we considered only 197 for data analysis. Incomplete questionnaires and questionnaires that did not fulfill the qualifying criteria for potential users were not included in the analyses. In the instructions given to the respondents, we asked them to respond to the questions by visualizing their preferred VW website. Among the 197 respondents, 42.6% were males and 57.4% were females. The average age of the respondents was 29.3 with a standard deviation of 5.8.

Variables and Measures

The scales were developed for various measures from prior studies (Agarwal and Karahanna, 2000; Compeau and Higgins, 1995; Davis 1989, Davis et al. 1989, Gefen, 2000; Moore and Benbasat, 1991; Venkatesh and Davis 2000). We also included two control variables of IT professional orientation and self-efficacy in the study. These variables are characteristics of the VW users that might impact their BI to use VW. IT professional orientation was a self-reported demographic characteristic of the respondents, whereas self-efficacy which is an individual characteristic is measured using an already validated scale (Compeau and Higgins, 1995).

Prior to testing our hypothesis, we conducted an exploratory factor analysis (EFA) using principal axis factoring to ascertain that the items loaded onto their corresponding latent factors. We checked the items for convergent and discriminant validity by factor analyzing items. Validity was established by considering both loadings and cross-loadings. It was checked that no item must loaded higher on another construct than it does on the construct it is designed to measure (Barclay et al., 1995). To further examine the pattern of association among indicators of the constructs, internal consistency of sub-constructs was checked using Cronbach's alpha. The high values of Cronbach alpha ranging from 0.80 to 0.95 highlight the reliability of the measures of the various constructs used in the study. Hierarchical regression analysis was used for testing the direct as well as moderating relationships. Following Aiken and West (1991) we created mean-centered variables before creating the interaction terms.

RESULTS

Table 1 presents the descriptive statistics and correlations for the variables in the model. Table 2 summarizes the results of hierarchical regression analysis. In the regression, equation we first entered the control variables of 'self-efficacy' and 'IT professional orientation' along with the utilitarian and hedonic motivational factors of 'usefulness', 'compatibility', 'enjoyment' and 'curiosity' in model 1. The interaction terms obtained by multiplying the each of the moderator variable 'familiarity' and 'control' with the independent variables were entered individually in the models 2a and 2b.

		Mean	S.D.	alpha	1	2	3	4	5	6	7	8
1	IT Profess.	0.14	0.35									
2	Self Efficacy	4.01	1.28	0.80	-0.06							
3	Usefulness	4.15	1.33	0.95	-0.02	0.49**						
4	Compatibility	3.55	1.58	0.94	-0.01	0.59**	0.59**					
5	Enjoyment	4.54	1.30	0.94	0.02	0.58**	0.57**	0.58**				
6	Curiosity	4.53	1.25	0.95	0.04	0.54**	0.46**	0.47**	0.65**			
7	Familiarity	3.19	1.59	0.94	0.12*	0.40**	0.33**	0.60**	0.44**	0.39**		
8	Control	4.30	1.22	0.86	-0.01	0.46**	0.48**	0.47**	0.71**	0.65**	0.37	
9	BI	4.22	1.34	0.87	-0.03	0.51**	0.71**	0.57**	0.54**	0.50**	0.40**	0.53**

n=197, *p<.05, ** p<.01[one-tailed test]

Table 1. Descriptive Statistics, Correlations and Reliability

	Variables	Model 1	Model 2(a)	Model 2(b)
Control Variables				
	Self-efficacy	0.089	0.078	0.101
	IT professionalism	-0.018	-0.035	-0.031
Independent Variables				
	Usefulness	0.501***	0.500***	0.499***
	Compatibility	0.138*	0.105	0.146*
	Enjoyment	0.046	0.024	0.030
	Curiosity	0.125*	0.125†	0.045
Interaction Terms				
			0.064	
			-0.060	
			0.121*	
			0.066	
			-0.124*	
		Control		0.155*
		Control X Usefulness		0.064
		Control X Compatibility		-0.142*
		Control X Enjoyment		0.254**
	Control X Curiosity		-0.136*	
Results	R ²	0.568	0.588	0.598
	Adjusted R ²	0.554	0.563	0.574
	F	41.642***	24.001***	25.031***
	Δ R ²	0.306***	0.020†	0.030**

n=197, † p<0.10, *p<.05, ** p<.01, ***p<.001[one-tailed test]

Table 2. Results of Hierarchical Regression Analyses

First, assessing the direct effects model [Table 3, model 1] with the two utilitarian motivations, we find that both usefulness ($\beta=0.501$, $p<0.001$), and compatibility ($\beta=0.138$, $p<0.05$), have significant relationships with BI. Thus, hypotheses H1a and H1b received strong support. Next, we examined the results for the direct effects for the two hedonic motivations. We find that the relationship of enjoyment ($\beta=0.046$, $p>0.1$) with BI is not significant, thereby not supporting H1c. In contrast, the relationship of the other hedonic motive of curiosity ($\beta=0.125$, $p<0.05$) with BI is significant, supporting hypothesis H1d. Further we observe that the overall change in variance in model 2 [Table 2] [$\Delta R^2 = .306$] is significant at $p<0.001$.

In the next step, [Table 2, model 3a], we added the interaction term obtained by multiplying the moderator variable 'familiarity' with the independent variables. We find that though the utilitarian motive of usefulness ($\beta=-0.060$, $p>0.1$) is not moderated by familiarity, thereby not supporting H2a but the other utilitarian motive of compatibility ($\beta=0.121$, $p<0.05$) is moderated by familiarity, offering support to the hypothesis H2b. This suggests that the effect of 'compatibility' on BI is strengthened in the presence of a higher level of 'familiarity'. Next, discussing the moderating effect of familiarity with hedonic motives, we find that familiarity has a non significant moderating effect with enjoyment ($\beta=0.066$, $p>0.1$) thereby not supporting H2c. Further, we find that 'familiarity' does moderate the role of curiosity in BI to use VW for workplace collaborations ($\beta=-0.124$, $p<0.05$), albeit in the direction opposite to the hypothesized one (negative direction). Thus, H2d is not supported. Although we hypothesized that the perceptions of familiarity will amplify the effect of curiosity on BI to use VW for collaborations, we find that familiarity attenuates the effect of curiosity on BI for workplace collaborations suggesting that familiarity substitutes the effect of the hedonic motive of curiosity in developing user intentions for workplace collaborations. Also, we observe that the overall change in variance [$\Delta R^2 = .02$] for model 3a [Table 2] is significant at $p<0.1$. This significant change in variance is because of the significant relationship of the interaction term of familiarity with compatibility and curiosity.

In the following step, [Table 2, model 3b], we added the interaction term obtained by multiplying the moderator variable 'control' with the independent variables. We find that usefulness ($\beta=-0.064$, $p>0.1$), is not moderated by perceptions of 'control' in forming intentions to use VW for collaborations, hence not supporting hypothesis H3a. Further, we observe that the task characteristic of 'control' negatively moderates the effect of the other utilitarian factor of 'compatibility' ($\beta=-0.142$, $p<0.05$). We had hypothesized it as a positive moderation and hence the moderation hypothesis H3b is also not supported. This suggests that perceptions of 'control' attenuate the role of 'compatibility' in determining usage intentions of VW for workplace collaborations.

Next, discussing the moderating effect of control on the hedonic motives, we find that 'control' positively moderates the role of the hedonic motivation of enjoyment ($\beta=0.254$, $p<0.01$), thereby offering support to the hypothesis H3c. Thus, we conclude that the hedonic perspective in VW is definitely important for BI to use, but a high level of control with the user enhances the effect of enjoyment on the usage intention. In contrast, we note that 'control' negatively moderates the effect of the other hedonic motivation of curiosity in determining the BI to use VW for collaborations ($\beta = -0.136$, $p<0.05$). We had hypothesized it as a positive moderation and thus our moderation hypothesis H3d is not supported. This result suggests that if the users have perceptions of 'control' while using VW, the effect of the hedonic motivational factor of curiosity on usage intention is attenuated. Further we observe that the overall change in variance in model 3b [Table 2] [$\Delta R^2 = .030$] is significant at $p<0.05$. This significant change in variance is due to the relationship of interaction term of 'control' with the utilitarian motive of compatibility and the hedonic motives of enjoyment and curiosity.

DISCUSSION

Results suggest the significant role of both the utilitarian factors described in this study viz. usefulness and compatibility. However, among the utilitarian factors, usefulness has a stronger relationship with BI as compared to compatibility. The results also suggest the significant role of the hedonic factors in motivating the usage intentions for VW collaborations. However, among the two hedonic factors 'enjoyment' does not play a significant role in determining usage intentions for VW collaborations while 'curiosity' has a significant relationship with BI. The plausible explanation for the non-significant relationship of enjoyment with usage intentions is that VW is being proposed for serious work related tasks like collaborations rather than as a recreational tool and hence users look more for the utilitarian benefits of this platform rather than fun. Results indicate the significance of the utilitarian factors of 'usefulness' and 'compatibility' and the hedonic factor of 'curiosity' in developing usage intentions of VW as a collaboration tool. These findings also indicate that compared to 'utilitarian benefits', 'hedonic benefits' plays a less salient role in developing usage intentions of VW for serious tasks like collaboration and information sharing. This suggests that companies contemplating investment in VW should emphasize on the greater 'usefulness' of this tool as compared to previous collaboration tools and also clearly state the 'compatibility' of this platform to the previously used methods for collaborations. The users should be introduced to the hedonic benefits of this tool with special emphasis on how VW can arouse their imagination and curiosity when using it for collaboration.

From the results for the moderation hypotheses we find that neither 'familiarity' nor 'control' moderates the role of usefulness in determining usage intentions of VW for workplace collaborations. This suggests that 'usefulness' is a significant motivating factor for the users in its own right and is not influenced by task success characteristics like

'familiarity' and 'control' for developing usage intentions. Further, we also observe that 'familiarity' positively moderates while 'control' negatively moderates 'compatibility'. This suggests that the relationship of 'compatibility' with BI becomes stronger in the presence of higher familiarity of the user. Thus, as the users' familiarity with the VW increases, the effect of their 'compatibility' on BI will increase. However, the negative moderating effect of control on compatibility suggests that increase in perceptions of control would attenuate the role of compatibility in determining usage intentions for VW collaborations. This suggests that VW developers and designers should not only introduce tools to increase the familiarity of the users with the VW environment so as to improve their compatibility with this platform, but also develop illusion of control for the users.

Next, we discuss the moderating role of 'familiarity' and 'control' on the hedonic motivators of 'enjoyment' and 'curiosity'. Surprisingly, the results suggest that 'familiarity' does not moderate the role of enjoyment in developing BI for VW collaborations. We tested for the direct effect of enjoyment, which was also non-significant. This suggests that in the scenario of VW usage for serious activities like collaboration and information sharing, the enjoyment aspect does not motivate users to use this technology even with increased familiarity levels. However, 'control' strongly and positively moderates enjoyment. The results suggest that when users perceive higher level of control while using the VW platform, they can 'with free mind' and 'greater confidence' enjoy the virtual platform even for serious collaborative tasks. This exhorts VW designers and developers to build-in features which would give the 'illusion of control' to the users. In the presence of control, VW users can enjoy serious business related tasks like collaborations.

Lastly, we also observe that both 'familiarity' and 'control' negatively moderate curiosity. This result suggests that in the presence of 'familiarity' and 'control', the role of curiosity is lessened. This result again reiterates the need to develop perceptions of familiarity and illusions of control in this VW platform so as to motivate the users to use this VW as a collaboration tool effectively.

IMPLICATIONS

Through this research, we make several important implications for research and practice.

Implications for Research

First, we present a VW collaboration model for BI to use VW for collaborations. This validated model can be used as a point of reference for future research in VW. Second, in the proposed VW collaboration model, the utilitarian and hedonic factors along with the moderating role of the task success characteristics of 'familiarity' and 'control' explain a significantly high percentage of variance (almost 59% variance) in BI for VW collaborations, highlighting the significant role of both the utilitarian as well as hedonic factors in explaining the usage of VW as a collaboration tool. Future research can investigate other motivational factors and task success characteristics in the context of VW. Third, this study particularly highlights the significance of 'familiarity' and the 'control' for motivating users to use VW for collaborations. Future research can study these task success characteristics in greater detail. Fourth, the study identifies task success characteristics or situations under which the role of motivational factors is either attenuated or enhanced for the usage of VW as a 'collaborative tool'. Future research can study examine the task success characteristics in greater detail which can mitigate the role of motivational factors.

Implications for Practice

In addition to having implications for research, the study also has several important implications for IS and VW designers, managers and practitioners. First, the study highlights the significance of the utilitarian and hedonic factors in developing usage intentions for VW as a collaborative tool. The study also demonstrates the salience of utilitarian motivators in comparison to hedonic factors. Results exhort VW developers and designers to seriously consider these motivational factors in their design to encourage the usage of this collaborative platform. Second, the study shows the importance of studying user needs and motivations in determining the behavioral intentions to use VW rather than technology alone. Thus, companies contemplating investment in VW should give special emphasis to user needs and understand their employees and their needs before investing a large amount in developing the technological infrastructure. Third, the study demonstrates the moderating effects of task success characteristics like familiarity and control. Illusions of 'control' have been shown to attenuate the role of motivational factors like compatibility and curiosity. Similarly, perceptions of familiarity have shown to enhance the effect of compatibility while a sense of control strengthens the enjoyment level of the VW user. These results direct VW developers and designers to build-in task success characteristics of illusions of control and perceptions of familiarity so as to simplify the task of motivating the users to use this VW platform for collaborations.

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