CONTINUOUS USE AND PURCHASING BEHAVIOUR IN SOCIAL VIRTUAL WORLDS

Matti Mäntymäki

Sarja/Series A-3:2011

Turun kauppakorkeakoulu
Turku School of Economics

ISBN 978-952-249-155-8 (nid.) 978-952-249-156-5 (PDF)
ISSN 0357-4652 (nid.) 1459-4870 (PDF)
UDK 004.4
004.7
366.1
658.89
316.3 – 053.7

Uniprint, Turku 2011

ACKNOWLEDGEMENTS

By three methods we may learn wisdom: First, by reflection, which is noblest; Second, by imitation, which is easiest; and third by experience, which is the bitterest.

Confucious

Looking back over the past few years of my doctoral studies and comparing my own process with experiences and stories of other PhD students, I feel I have reached this point in a relatively smooth and straightforward way. Leaving aside the psychological tendency to avoid a state of cognitive dissonance – and find ways to rationalise bad decisions as somehow making sense – I genuinely see the past four years as a wonderfully rewarding period, perhaps one of the best times in my life thus far. Many deserve thanks for making this voyage the pleasure it has been.

I have had the privilege to have three supervisors for my dissertation process. D.Sc., Adjunct Professor Jussi Puhakainen has been an invaluable guide and mentor throughout the PhD process. It would be impossible to list all the things he deserves credit for in the past four years and more, I shall simply state that, ceteris paribus, this process would not have existed without the initial spark he provided. Professor Hannu Salmela has offered me his valuable advice on how to improve the manuscript and guided me through the pre-examination process. Professor Reima Suomi has been a consistent sponsor of my doctoral studies starting from accepting me as a PhD student to carefully reviewing my manuscript. I wish to extend my most sincere thanks to Jussi, Hannu and Reima for all their effort in making my dissertation process successful.

I am grateful to Professor Christer Carlsson from Åbo Akademi University for accepting the invitation to act as the opponent of my dissertation. In addition, I wish to express my gratitude to Professor Matti Hämäläinen from Aalto University School of Science and Professor Piet M.A. Ribbers from Tillburg University for acting as the official pre-examiners. Their insightful comments have been of great value in improving the academic value of the dissertation. I am deeply honoured to have had such a group of esteemed and experienced scholars contributing to my doctoral dissertation.

Several institutions have offered support for my dissertation process. I express my gratitude to Turku School of Economics and Turku Centre for Computer

Science (TUCS) for providing me with the funding and physical premises to conduct my research. I wish to thank Professor Satu Lähteenmäki, the Director of Turku School of Economics and Professor Tapio Reponen, the Vice Rector of University of Turku for the premises to conduct my research. Finally, membership of the Finnish Center for Service and Relationship Management (FCSRM) has been valuable in positioning my research.

When starting the dissertation process, I had no knowledge of Habbo Hotel or social virtual worlds. So, one of the most fortunate coincidences during this process was the opportunity to start investigating the users of Habbo Hotel. In this regard, I wish to give special recognition and express my thanks to Sulake Corporation for providing me with the opportunity to conduct the empirical research. I especially wish to acknowledge the help of Sulka Haro, Marjoriikka Ylisiurua, Heini Kaihu, Mikael Thuneberg and Aino Luode at Sulake with the data collection.

I also wish to thank Nokia Corporation for the great flexibility by providing me an extended time-off to focus fully on doctoral studies and research. I especially thank my two line managers, Marina Kallioniemi and Ismo Nurmi for their positive attitude towards my studies and for extending my study leave.

I wish to express my thanks to all my colleagues at entire Information Systems Science staff at Turku School of Economics and Turku Centre for Computer Science (TUCS). In particular, I wish to thank Jani Merikivi for introducing me to the field of social virtual worlds and Habbo Hotel. It has been a pleasure to experience the ups and downs of our project with a trusted partner. I also wish to express my gratitude to D.Sc. Hongxiu Li for her encouraging comments throughout the process. I also wish to thank Eeva Heiro for the enjoyable time we have spent in our shared office and D.Sc. Reetta Raitoharju for getting me started with quantitative research methods. Professor Jari Salo from Aalto University School of Economics has been an important unofficial supervisor and mentor by patiently commenting on several versions of the manuscript. Finally, Birgit Haanmäki has been irreplaceable in helping with all the practicalities and making the defence happen.

I have greatly benefited from working with scholars more experienced and talented than myself. Hence, I wish to express my deepest thanks to all my co-authors, Frans Feldberg, Eeva Heiro, Sami Kajalo, Jarmo Kinos, Eija Koskivaara, Najmul Islam, Mikko Lankinen, Seppo Leminen, Hongxiu Li, Yong Liu, Jani Merikivi, Päivi Pihlaja, Reetta Raitoharju, Risto Rajala, Jari Salo, Annukka Vahtera and Tibert Verhagen, for their valuable contributions and insight. In particular, I wish to thank to Dr. Kai Riemer from the University of Sydney for our inspiring research collaboration in Sydney, Australia.

My dissertation process has been financially supported by the Jenny and Antti Wihuri Foundation, Foundation for Economic Education (Liikesivistysrahasto),

the Ella and Georg Ehrnrooth Foundation, the Marcus Wallenberg Foundation, the TeliaSonera Foundation, the Nokia Foundation, the Foundation of Economic Education in Turku (Turun Kauppaopetussäätiö), Turku School of Economics Supporting Fund, Turku Society for Commerce Foundation (Turun Kauppaseuran Säätiö) and The Finnish Work Environment Fund (Työsuojelurahasto). I gratefully acknowledge their support.

My friends have been a source of positive energy throughout the process. It has been a pleasure and honour to share many of the most memorable moments with you. I also gratefully acknowledge the spiritual support provided by my relatives.

I wish to express my gratitude to the people who I am the most indebted to. I want to thank my mother Kaarina and father Olavi for all their encouragement and support during my 20 years of study, but most of all for their support throughout my life. Finally, I especially wish to thank my loved one Eriikka for being the best companion one could wish to have –. I thank you for your careful and thorough review of my manuscript and for being my guide through the academic jungle. I am grateful that we have come this far together. I look forward to sharing even more with you.

Turku 6th of May 2011

Matti

Table of Contents

List of Figures

List of Tables

List of Appendices

1 INTRODUCTION

1.1 Phenomena of interest

Virtual worlds such as Second Life, Habbo and Vivaty, to name but a few, have become increasingly prominent spaces for social interaction, but have also increased in their economic importance. It has been estimated that the total number of people registered in virtual world users will mushroom, exceeding 1 billion by 2018[1]. For example, Habbo, the largest virtual world for teenagers, added tens of millions of new customers in 2010. In comparison to demand, competition is expected to become even more heated as the market is anticipated to grow from the current 150 to almost 900 virtual worlds in two years time[2].

Club Penguin, a virtual environment targeted at users aged between 6 and 14 was reported to have 12 million subscriptions in 2007 before being acquired by Walt Disney Corporation. Virtual environments are becoming increasingly lucrative from a business perspective. According to Linden Labs, the users of Second Life spent more than 160 million USD on virtual goods and services during the first quarter of 2010[3]. Virtual worlds offer new business opportunities not only to individuals but also to companies. For example, automotive manufacturers Nissan and Toyota have a presence in Second Life, enabling visitors to purchase and customise virtual cars (Messinger et al., 2009).

At the time of writing, Habbo Hotel has 32 local communities with a total of 200 000 000 registered users and 11 000 000 monthly visitors[4]. The child-focused Club Penguin and Webkinz attract millions of young visitors per month. Virtual worlds influence the way individuals spend their free time and interact with other people, but have also been claimed to have a profound societal and economic impact (Messinger et al., 2009).

---

1 Caoili, E. (2008). Strategy Analytics: 1 Billion Virtual World Users By 2018. http://www.worldsinmotion.biz/2008/06/strategy_analytics_1_billion_v.php>

2 Kzero, Virtual Worlds 2010 and beyond. Key industry trends and market developments, 2009, KZero Worldwide Report, 1-27.

3 Second Life Economy Hits New All-Time High in Q1 2010. http://blogs.secondlife.com/community/features/blog/2010/04/28/second-life-economy-hits-new-all-time-high-in-q1-2010

4 Habbo Hotel – Where else? http://www.sulake.com/habbo/

Virtual worlds provide not only new opportunities for communication and social interaction but also tools for self-expression, entertainment and the spending of free time. Decorating one's virtual space and dressing the avatar are a means of developing one's virtual identity. Games and events organised by virtual world operators and users are popular ways of being involved in virtual worlds. The sub-communities within the virtual worlds, including guilds in World of Warcraft and groups in Habbo, reflect social dynamics and hierarchy among members.

Given the fact that the field of virtual worlds is large and covers a considerable number of services and different user groups, this research focuses on social virtual worlds (SVWs). The use of SVWs is growing rapidly, especially among users under 20 years old. Despite this growing use, finding a sustainable revenue model has remained a challenge for SVW providers. The shutdown of the virtual world There in March 2010 is a concrete example of the importance of being able to convert use into revenue. Furthermore, SVWs are interesting from a research perceptive since they combine elements of social networking sites, online communities and online games. Similarly to online communities and social networking sites, social interaction between the users is a core component of user attraction. However, in contrast to 'traditional' online communities and social networking sites SVWs contain graphic elements like avatars and a 3D virtual space in which the users can move their avatars (Hemp, 2006). Yet, contrary to games, SVWs have no specific goals or tasks to be accomplished (Reeves et al., 2008). As a result, SVWs can be defined as *persistent computer-mediated 3D environments, designed for entertainment and social interaction, where the users are represented as avatars* (Bartle, 2003; Bell, 2008; Rheingold, 2000).

From a wider perspective, virtual worlds are part of the large and fast evolving phenomenon of online social networking and gaming, including online communities, social networking sites and massively multiplayer online games (MMOs), referred to as social computing (Messinger et al., 2009; Parameswaran & Whinston, 2007). Social computing has become an increasingly popular way of spending free time, sharing experiences and interacting with other people. Besides social activities, social computing services are used to generate real sales for companies such as Dell, which claims its sales attributed to Twitter have surpassed USD 3 million.[5] From a wider perspective, the annual revenues of the US video-game industry exceeded that of motion-picture revenues in 2007 (Messinger et al., 2009, 204). Moreover, according to PC Gaming Alliance (2009) the yearly revenue of World of Warcraft is estimated to soon surpass 1

5 Gosalves, Antone: "Dell Makes $3 Million for Twitter-related Sales", InformationWeek 12 Jun 2009.

billion USD. Taken together, these figures exemplify some of the business potential in the field of social computing.

Due to the proliferation of various online services, the importance of attracting and retaining existing users (Bhattacherjee, 2001a; Bhattacherjee, 2001b; Cyr et al., 2007; Gefen, 2002; Hong et al., 2006a; Reichheld, 2000), as well as maximising customer lifetime value (Rust et al., 2010) has been widely recognised. Thus, in addition to examining the acceptance and adoption of new ICTs, recent technology acceptance research has been paying increasing attention to continuous use and post-adoption user behaviour (Bhattacherjee, 2001b; Hsieh et al., 2008; Jasperson et al., 2005; Karahanna et al., 1999; Kim & Son, 2009; Limayem et al., 2007; Ortiz & Markus, 2009). Due to the increasing use of ICT in domestic and leisure-driven contexts, the post-adoption and continuance perspective have become salient. In a voluntary context, where there are many competing services, the continuous use of an SVW by a user, after their initial acceptance of it, is far from self-evident.

Thus, as with several other online services, attracting and retaining existing users is paramount to the survival of SVWs. Furthermore, rather than coming at the initial acceptance or trial phase, the greatest challenge lies in the retention of an active group of existing customers. As a result, instead of initial acceptance, the present study focuses on investigating the drivers of continuous engagement with SVWs.

Most SVWs do not charge for periodic subscriptions but generate revenue through micro-transactions i.e. selling premium memberships and/or virtual items to users. Additionally, SVWs can allow basic access to their service for free, but may provide a premium membership only for a periodic subscription i.e. they apply the *freemium* business model. Irrespective of the revenue model, monetising the customer base plays a pivotal role in determining the financial success of SVWs.

In sum, from a user perspective, SVWs contain elements from online social networking, e-commerce and gaming. Their sustainability is largely dependent on the ability to attract and retain a sufficient number of users who actively use the service and spend real money purchasing virtual items and value-added services.

1.2 Motivation and research gap

Virtual worlds have been researched in several disciplines, such as economic sociology (Lehdonvirta, 2009b), economics (Castronova, 2005), marketing (Hemp, 2006) and information systems (IS) (Hua & Haughton, 2009) to name a few. As argued by Messinger et al. (2009, 218), virtual worlds are a new area of

research, which is still in a formative phase. Thus far the research has been somewhat fragmented and lacking in clear streams of inquiry. However, it has made considerable efforts to try and make sense of what virtual worlds are and how they can be defined and categorised (see e.g. Tikkanen et al., 2009).

For IS research, virtual worlds are an interesting area of study since they include online entertainment, online social networking and e-commerce. In particular, understanding relevant user behaviour and their determinants is an area where research is needed.

A substantial part of the current research examining virtual worlds from a user point of view has focused on the acceptance perspective that applies the Technology Acceptance Model (Fetscherin & Lattemann, 2008; Hua & Haughton, 2009). Yet, although initial acceptance is important, retaining existing customer and encouraging virtual purchase behaviour are equally pivotal to SVW providers. Continuous use and a sustainable revenue model are crucial in the SVW setting, and also from the wider perspective of the field of online services. Nevertheless, it remains true that; although IS continuance and post-adoption behaviour have been examined in prior literature, there are still under explored research areas, as Kim & Son point out(2009, 50):

> *"a majority of post-adoption research focuses on individuals' behaviors in organisations (e.g., IT exploration, innovation with IT), but little has systematically examined behavioural outcomes that are uniquely salient in the context of online services. Accordingly, the IS literature has little relevance for those who seek to understand online consumer behaviour at the post-adoption stages"*.

Moreover, Kim & Son (2009) argue that when investigating behavioural outcomes prior post-adoption research has largely focused on the repetitive use aspect and thus far neglected other behavioural outcomes transcending usage.

Purchasing can be regarded as a pivotal element of consumer behaviour both in offline and online contexts (Childers et al., 2001). The environments of online social networking, such as SVWs, provide a new context for online shopping, since the items and services can only be consumed inside the virtual environments. As a result, there is a need for a better understanding of consumer behaviour in these virtual environments (Shin, 2008). Taken together, the first research gap relates to understanding both the sustained users engagement and other relevant behaviours that contribute to the success of an SVW.

As regards the second research gap, from a managerial viewpoint the phenomenon of social computing, including social virtual worlds and also social networking sites and social media services are emergent in terms of the number of potential customers as well as their business potential. However, having high numbers of users has not, thus far, fully materialised into bottom-line profits. As

an example of the challenges related to establishing a sustainable revenue model the failure of the popular virtual world There to support itself financially stands out – it was closed in March 2010.

For operators of SVWs as well as social networking sites, retaining active existing customers active, while figuring out how to monetise their use, is a key priority. For social computing services generating money from micro-transactions, e.g. selling virtual items, understanding the drivers of purchase behaviour is essential, whereas for the freemium model reinforcing the conversion of a user into a customer is a key challenge. However, only a small amount of prior literature has empirically examined these issues.

The third research gap relates to the demographic profile of the users**.** The user group in the interest of this study are teens. Prior IS research has investigated certain special groups, such as elderly people (McCloskey, 2006) and the socially disadvantaged (Hsieh et al., 2008) as users of technology, but relatively few studies have focused on teens. Of course, prior literature on virtual worlds targeted towards the young exists (see e.g. Griffiths & Light 2008; Lehdonvirta et al., 2009; Lehdonvirta 2009a; 2009b; Iqbal et al. 2010), but that research has largely focused on Second Life. However, the majority of SVWs are targeted at users under the age of 20 (Spence, 2008) and according to the VW consultancy Kzero, more than of the registered VW users are below 15 years of age[6].

As regards the fourth research gap, prior IS literature has discussed the acceptance of hedonic information systems (van der Heijden, 2004) and the role of intrinsic and extrinsic motivation (Davis et al., 1992; Shang et al., 2005; Teo et al., 1999; Venkatesh, 2000) in the acceptance of ICT. In addition, the role of social influence in the form of subjective norms (Schepers & Wetzels, 2007), perceived critical mass (Lou et al., 2000; Sledgianowski & Kulviwat, 2009; Van Slyke, 2007) and network externalities (Dickinger et al., 2008; Lin & Bhattacherjee, 2008) has been scrutinised.

Alongside the utilitarian-hedonic dichotomy, extensively applied in prior IT acceptance literature, there is a rapidly growing category of applications and services that are simultaneously used for utilitarian, hedonic and social purposes (Hong & Tam, 2006; Lin & Bhattacherjee, 2008). As an example, SVWs, as well as e.g. social networking sites, can be used for various purposes, e.g. interacting with other people, communicating with friends, playing games and merely passing the time of day (spending time). In services used for social interaction and communication, the potential utilitarian or hedonic value of SVWs is largely dependent on the presence of other users. However, with regard to the fourth research gap, relatively few studies have made attempts to holistically grasp the

6 http://www.kzero.co.uk/blog/?p=4448

role of the utilitarian, hedonic and social determinants of continuous use in the context of the online services used for hedonic and social purposes.

Habbo is an SVW targeted at young people and hence cannot be considered to represent the field of social computing as a whole. Nevertheless, Habbo has been able to remain successful over many years. Moreover, today's Habbo users will be the future adults, consumers and users of ICT applications. As a result, the findings of this study can offer the developers of social computing services certain insights into the perceptions and preferences of the Habbo generation.

Since virtual worlds are attracting increasing audiences, particularly among the young generations, and the time and money used in virtual environments is increasing, a better overall understanding of this phenomenon is important from a societal perspective. This understanding can help policymakers and government officials to evaluate the opportunities, challenges and risks associated with increasing SVW participation.

1.3 Aim of the study and the research questions

The area of research to which this study aims to contribute can, in broad terms, be referred to as online consumer behaviour. Within this area the contextual domain of this study is social virtual worlds and the behaviours of interest are continuous use and the purchasing of virtual items and services. The positioning of the study is illustrated by Figure 1.

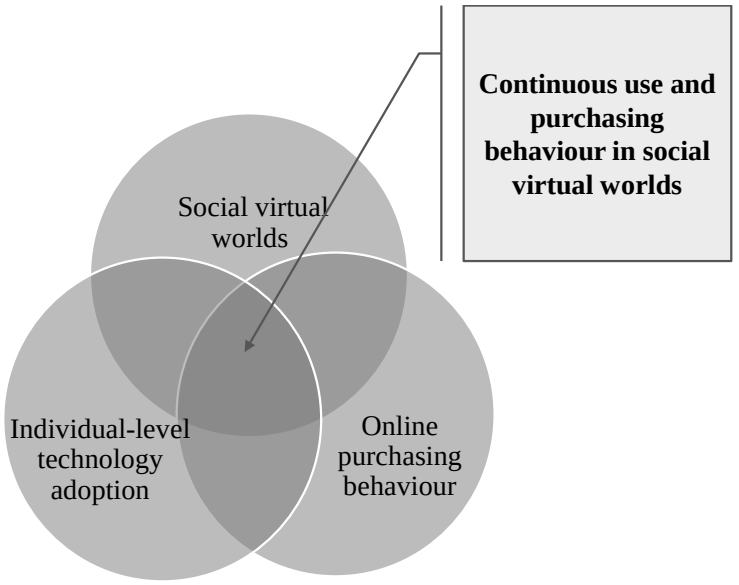

Figure 1 Positioning of the study

To fill the four main research gaps in the previous literature, the aim of the study is to investigate the determinants of two important post-adoption behaviours in the SVW context, namely continuous engagement in the service and the purchasing of virtual items and value-added services. In order to meet the objectives of the study, two research questions are postulated:

RQ1: What factors drive teens' continuous engagement in social virtual worlds?

RQ2: What factors drive teens' purchasing of virtual items and value-added services?

By answering the research questions this study fills the research gaps identified and attempts to make four main contributions to the literature. First, this research contributes to research on user behaviour in virtual worlds by developing an integrative framework for applying the approach taken by Venkatesh et al. (2003) to examine the determinants of continuous SVW use and the purchasing of virtual items and services.

Second, by examining purchasing behaviour in the SVW context, the present study participates in the recent discussion on *virtual commerce* (Arakji & Lang, 2008). In addition, this study examines the relationship between continuous use and purchasing to understand the extent to which users convert into customers.

Third, the present study aims to contribute to multi-disciplinary research on virtual worlds by empirically examining an SVW targeted at teens and teens as users of an SVW.

Fourth, from a broader perspective, this study provides information on the factors that influence sustained user participation in services for social computing, particularly virtual worlds (Parameswaran & Whinston, 2007).

To summarise chapters 1.2 and 1.3, the research gaps and areas of contribution are presented in a condensed form in Table 1.

Table 1 Summary of the research gaps and areas of contribution

Research gap	***Area of contribution***
1. Understanding of the drivers of continuous user engagement and purchasing behaviour, especially when combined, in virtual worlds.	Virtual worlds + virtual commerce
2. The conversion process from users to customers in the context of online services.	Virtual commerce + social computing
3. SVWs targeted at teens and IS research on teens as users of information technology.	Virtual worlds + social computing
4. The role of utilitarian, hedonic and social drivers of continuous user engagement in online services for hedonic and social purposes.	Social computing + virtual worlds

From a managerial perspective, the present research provides operators in virtual worlds and social networking sites insight on how to retain their customers and the extent to which continuous engagement in a service can be expected to lead to purchasing behaviour. It is important for the operators to encourage and promote spending on virtual goods, this research provides information about the factors predicting purchasing behaviour in social virtual worlds.

Being engaged and spending real money in virtual worlds as well as other online environments is increasingly common, especially among the younger generations. Therefore, this study also attempts to provide political and governmental decision-makers insight into the factors driving sustained SVW participation and purchasing behaviour, and hence provide a better understanding of the phenomena related to virtual worlds in general.

1.4 Context of the study

The contextual domain of the present study is social virtual worlds. According to Jung & Kang (2010) virtual worlds can be divided into two main categories, gaming virtual worlds (GVWs) and social virtual worlds (SVWs). GVWs typically have explicit narratives and predetermined goals for the users. SVWs do not have explicit goals, plots or storylines, and the focus is on social interaction between the users.

Habbo Hotel is the world's most popular virtual world for teens. Habbo has 200 000 000 registered users, almost 11 million monthly unique visitors in 35 local Habbo portals using the local language and having localised content as well as a local payment system. Founded in 2000 under the name Kultakala, Habbo is one of oldest virtual worlds, which also explains the large difference between the number of registered and active users. In the highly turbulent VW business, the fact that Habbo has been able to retain its popularity and increase its user base over the years makes it an interesting research context. A view inside Habbo is presented in Figure 2.

Figure 2 Celebrating the 100 000 000th Habbo user

This research focuses empirically on the Finnish Habbo portal. This choice is based on the Finnish portal often being the first one to introduce new features and functions. However, the key features and the user interface as well as the demographic target group are analogous to all Habbo portals.

Habbo does not have predefined goals or explicit tasks for the users to accomplish. Moreover, it does not include a narrative storyline or the level-up characteristic found in games. The attraction for users is based on the social interaction that occurs between the users, events organised by the operator as well as the users, and a variety of non-violent games the users can play. Each user has a customisable animated avatar as well as a personal room to decorate and invite other users into. A wide selection of virtual items e.g. clothing, furniture, pets and accessories can be purchased using Habbo Credits, a virtual currency which is purchased with real currency. In addition, the users can purchase a subscription for a premium membership, Habbo Club, which offers certain benefits and additional features not available to standard users, such as a wider selection of outfits for avatars, special moves for dancing and a larger maximum number of people that can be included on the friends list. In contrast to Second Life, Habbo does not allow user-to-user trading using the virtual currency, although the virtual items can be exchanged between the users.

Moreover, unlike Second Life, in Habbo the users cannot manipulate the surroundings of the virtual environment.

Habbo does not apply usage fees or periodical subscriptions, but the revenue model is built on micro-transactions, i.e. selling virtual items and premium memberships. In addition, Habbo sells advertising space and collects information about its users to be sold to marketing researchers. As a result, using Habbo does not require a monetary investment from the user.

Since Habbo is targeted towards teenagers i.e. minors, corporate social responsibility has been emphasised and is a focal point. Thus, several means of protecting the users are applied. For instance, the discussions of users under the age of 15 are moderated and user accounts can be suspended for inappropriate conduct. Furthermore, bad language is automatically filtered.

Habbo users are provided with a reporting tool, which enables the reporting of inappropriate content to staff members. Habbo also co-operates with governmental and non-profit organisations working for the welfare of young people. Inside Habbo, the users can e.g. contact virtual social workers and discuss their problems.

1.5 Scope of the study

Stemming from the IS research tradition, in the present study, SVWs are viewed primarily as information systems. Respectively, the people involved with SVWs are called users. The unit of analysis is the individual and the focus of the research is on investigating how the perceptions of the individual user determine the two behaviours. Consequently, since the focus is on the individual user, issues related to group behaviour and group dynamics in the SVW are excluded from the scope of this research.

Culture is a fundamental factor influencing human behaviour, including the adoption and use of technology (Karahanna et al., 2005). The use of virtual worlds is likely be influenced by the layers of culture the user is exposed to outside the virtual world as well as the culture of the virtual world itself. As regards national-level culture, this research empirically examines Finnish Habbo users. Given the challenges of capturing all the relevant layers and dimensions of culture, its role is not explicitly examined within this research.

As regards purchasing behaviour, the economics research tradition views price as the ultimate factor determining the point of equilibrium between supply and demand. The influence of price is acknowledged within this study, but the investigative locus relates to the perceptions of the IT artefact and thus price is excluded from scrutiny.

Continuous use and purchasing can be manifestations of behavioural loyalty in the SVW setting. However, contemporary marketing literature has found customer loyalty to be a more complex phenomenon and psychological process than the two behaviours examined here; continuous user engagement and purchasing (Harris, 2004; Oliver, 1999). Because of the width and depth of the respective literature, the loyalty discussion is excluded from the scope of this study.

1.6 Research Strategy

The research strategy can be defined as "*a way of going about one's research, embodying a particular style and employing different methods*" (Weick, 1984). To gain an understanding of the phenomena of interest, literature reviews are conducted. The literature reviews focus on three areas, social virtual worlds, technology adoption and online purchasing behaviour. These areas were selected since SVWs represent the contextual domain of the research, whereas continuous use and purchasing are the key behaviours of interest. Thus, the overall nomological net of the research stems from the research on these areas.

The purpose of the literature review is to gain an understanding of some of the most widely used theoretical approaches in examining the key behaviours of interest. Thereafter, the SVW use context is placed under closer scrutiny to understand the extent to which the theoretical tools identified in the literature reviews could be utilised and to what extent alternative approaches needs to be looked for. After establishing the nomological net, research hypotheses are developed. Figure 3 illustrates the areas in which the origins of the nomological net were identified.

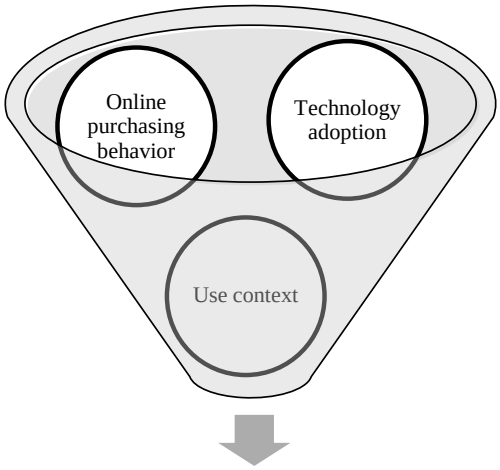

Figure 3 The process of developing the nomological net

The research method of this study is a survey. The survey method was selected primarily to be able to measure the relationships between the research constructs. The empirical data was collected with an online questionnaire from Finnish Habbo users and analysed using structural equation modelling (SEM). The positivist view, as it is understood within IS research, is the one adopted (Chen & Hirschheim, 2004). Positivism has been the dominant paradigm in technology adoption research (Williams et al., 2009). However, in this study positivism is not viewed in its strictest sense as regards e.g. causal explanation. Instead, the post-positivist view that the research questions should guide the selection of the research method is favoured (Wildemuth, 1993, 450). A more detailed elaboration of the research methodology and philosophical underpinnings of the study are given in Chapter six.

Figure 4 elaborates the research process and presents the main activities during the process.

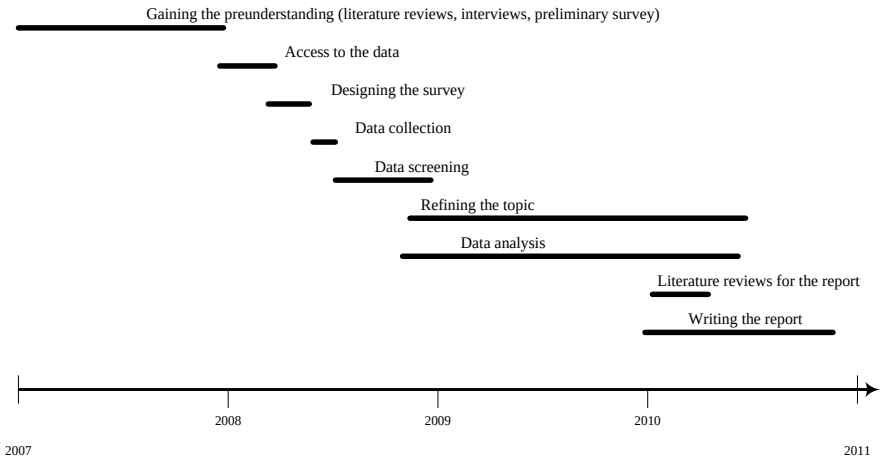

Figure 4 Timeline of the research process

The temporal sequence of the activities in the process has largely followed the conventional approach of deductive survey research i.e. it starts with the development of a survey instrument, followed by data collection and analysis. However, the actual focus of the research has somewhat evolved during the data analysis process.

The research process has been conducted as a joint project with another IS researcher. The aim of the project was to provide sufficient empirical data for two doctoral dissertations and other publications. The publications resulting from the research project are briefly presented in chapter 6.4, covering the research design.

1.7 Outline of the study

This report is organised into nine chapters. The introductory chapter illustrates the background of the research topic, aiming at describing why social virtual worlds are a phenomenon worth studying from an IS perspective. Thereafter, the research gaps the research aims to fill are presented. Finally, the scope and structure of the study are presented.

Chapter two describes the contextual domain of the study by presenting and conceptualising social virtual worlds. Furthermore, the existing research on virtual worlds, as well as the terminology and definitions, are presented. To relate SVWs in the field of virtual worlds, categorisations of VWs are presented.

Chapters three and four present a review of the selected literature on individual level technology adoption and online purchasing behaviour. In chapter three models for examining individual-level technology adoption are presented.

A separate subchapter is dedicated to the research on IS continuance and post-adoption research. The final section of the chapter covers prior research that has examined the adoption of virtual worlds.

In chapter four, the literature on online purchasing is reviewed. The chapter concludes with a summary of prior research on purchasing behaviour in virtual worlds. After chapter four, the contextual and theoretical backgrounds of the research are presented.

Chapter five contains the building of the research model and the development of the hypotheses. The chapter begins by elaborating on the use context of SVWs to gain an understanding of the contextual factors that drive usage behaviour. Thereafter, the applicability of different theoretical tools is discussed and the nomological net of the research model is presented. The chapter concludes by presenting the testable research model and hypotheses.

In chapter six, the research methodology is presented. This chapter includes the philosophical underpinnings of the research, as well as a discussion of the ethics of the research. In addition, the research method and the data collection procedures are presented.

Chapter seven contains the reporting of the empirical research. It elaborates on how the quantitative analysis was conducted and presents the results. In this chapter, the validity and reliability of the measures are discussed and it concludes by comparing the results obtained from testing the research model to reference models from prior technology adoption literature.

In chapter eight the findings from the empirical research are discussed in relation to prior research. Chapter nine discusses the theoretical and managerial implications as well as the limitations of the study. The research questions are revisited and avenues for further research are presented.

2 SOCIAL VIRTUAL WORLDS

This chapter provides an overview of the contextual domain of the study. First of all a very brief overview of the history of VWs is given, followed by a summary of the multitude of definitions and categorisations given to VWs. The chapter begins with a general discussion about VWs to help the reader position SVWs in the field of VWs and to understand the origins and development of the VW phenomenon. Finally, a separate subsection provides an overview of the current situation regarding research on SVWs.

2.1 Origins of virtual worlds

The concept of a virtual world as understood in this study originates from science fiction or cyberpunk literature and was coined by Neil Stephenson in his novel Snow Crash in 1992 (Kaplan & Haenlein, 2009; Lehdonvirta, 2009b). In the novel, the main character, Hiro Protagonist, who in real world works as a pizza delivery boy in early 21st century Los Angeles but spends the majority of his free time as a warrior prince in a three-dimensional virtual world called the Metaverse. In the Metaverse the participants appear as personalised avatars that are able to meet friends, visit night clubs and other places as well as take virtual drugs such as the snow crash.

Today, the once science fictional ideas of Stephenson have to a large extent, become reality. Thus, the novel has become a famous example of the long tail phenomenon (Anderson, 2006). The long tail refers to the business logic of, for example, Amazon.com where a significant stream of revenue comes from a large number of low-volume items. When virtual worlds started to attract more participants and media attention the result was that Stephenson's almost forgotten novel become interesting and a bestseller.

There are more than one hundred virtual worlds on the internet attracting millions of individual users, but also businesses and public organisations due to the expected profit potential (Kaplan & Haenlein, 2009; Tikkanen et al., 2009;

Wagner, 2008). Moreover, according to Strategy Analytics, the overall number of people involved in virtual worlds will reach 1 billion by 2018[7].

The first relatively widely used predecessor of today's virtual worlds, Alpha, was created in 1995 (Kaplan & Haenlein, 2009). Thus, virtual worlds are a relatively new phenomenon. The predecessors of today's virtual worlds were multi-user dungeons (MUDs), text-based online games. Compared to today's graphically rich 3D environments, the user interfaces have developed drastically. Furthermore, the supply of virtual worlds has expanded rapidly; a user can select a world designed for gaming, interact socially, and create a virtual identity and a personal environment, or a world where all those activities are possible.

2.2 Defining virtual worlds

Table 2 below illustrates some of the definitions of the term virtual world that can be found in the academic literature. The variety of definitions reflects the fact that the phenomenon has been approached from a number of perspectives and thus, characteristically for a research area in a formative state, no universally accepted definition exists at this point of the evolution of the research area (Warburton, 2009).

7 Caoli (2008): Worlds in motion – Strategy Analytics: 1 Billion Virtual World users

http://www.worldsinmotion.biz/2008/06/strategy_analytics_1_billion_v.php.

Table 2 Definitions of virtual worlds

Definition	***Source***
"graphically-rich, three-dimensional (3D), electronic environments where members can assume an embodied persona (i.e. avatars) and engage in socializing, competitive quests and economic transactions with globally distributed others"	Schultze et al. (2008)
"a synchronous, persistent network of people, represented as avatars, facilitated by networked computers"	Bell (2008)
"computer-simulated three-dimensional environment in which individuals interact. On screen, users are represented by an avatar"	Chesney et al. (2009)
"an immersive virtual reality space where people interact with one another via avatars, which are graphical, 2- or 3-D representations of a user"	Shen & Eder (2009a)
"an Internet-based simulated environment that emulates the real world and is intended for its user to inhabit and interact through avatars"	Bainbridge (2007)
"online social networks where inhabitants are referred to as avatars"	Hua & Haughton (2009)
"three-dimensional (3-D), multi-media, multi-person simulation environments, where each participant adopts an alter ego and interacts with the world in real time. World activity persists even if a player is off-line"	Wagner & Ip (2009)
"open-ended virtual interaction platforms or 'experience worlds'; thus, goals are not prescribed, and virtual worlds are not games in the traditional sense"	Barnes & Mattsson (2008)

In addition to the explicit definitions presented in Table 2, e.g. Kaplan and Haenlein (2009), while not providing an explicit definition of a virtual world, discuss what VWs are by distinguishing them from other related services. According to Kaplan and Haenlein (2009), virtual worlds can be considered distinct from other forms of social media due to three characteristics. First, in virtual worlds, the interaction between users can take place in real time, in contrast to e.g. YouTube or Wikipedia. Second, in virtual worlds the users can create customised avatars to present themselves. The avatar can resemble the user's real life appearance or be an entirely different and separate person or creature. Third, compared to e.g. online communities and blogs that consist of text and pictures, the environment in virtual worlds is three-dimensional (Kaplan & Haenlein, 2009). Taken together, that description of the characteristics of VWs encompasses the key content of the existing VW definitions.

To formulate a definition for a virtual world, this study takes the definition made by Bell (2008) as its foundation and highlights three core elements in

Bell's VW definition. Bell's three core elements encompass the aspects of VWs that are widely accepted and addressed when defining VWs. These are:

- synchronous communication
  > the interaction and communication in a VW takes places in real time synchronously, which contrasts with e.g. email.
- persistent
  > when the user leaves the VW the activities inside the world continue, which contrasts with e.g. traditional computer and video games
- avatars, as described by Bell (2008, 3)
  > "any representation (graphical or textual), beyond a simple label or name, that has agency (an ability to perform actions) and is controlled by a human agent in real time"

For the purposes of this study, a virtual world is defined accordingly as: *a persistent computer simulated environment, in which multiple users simultaneously interact through avatars.*

This definition does not take a stance on the nature or dimensions of the graphics in the environment, or the activities taking place inside the VW, but intentionally retains a neutral outlook on those issues. The key aspects of VWs highlighted in the definition are that VWs are persistent, i.e. do not generally appear and disappear spontaneously or suddenly. Additionally, a VW includes some form of environment where users interact. Finally, they enable multiple users to be involved at a same time and present the users as avatars. According to Collins English Dictionary, the word avatar originates from Sanskrit and refers to the *"manifestation of a deity, notably Vishnu, in human, superhuman or animal form"*.

In addition to the varying definitions, the terminology, when speaking of VWs, is somewhat diverse. Virtual world is the most commonly used term in the literature when measured by the number of hits from the ABI/Inform and EBSCOhost Complete bibliographical databases. In addition to the term virtual world, the literature includes concepts that have a related or isomorphic meaning. For example, the terms synthetic world, massively multiplayer online, metaverse and multi-user virtual environment have been used. Table 3 presents the definitions of these competing terms.

Table 3 Alternative terminology for virtual worlds

Term	***Definition***	***Source***
Synthetic world	"Crafted places inside computers that are designed to accommodate large numbers of people."	Castronova (2005, 4)
MMO (massively multiplayer online)	"An online service with a large number of users interacting with each other synchronously, often trough an avatar situated in a virtual spaces."	Lehdonvirta (2009b, 47)
Metaverse	"Immersive three-dimensional virtual worlds (VWs) in which people interact as avatars with each other and with software agents, using the methaphor of the real world but without its physical limitations."	Davis et al. (2009, 90)
MUVE (multi-user virtual environment	"Online, multi-user virtual environments, sometimes called virtual worlds."	Wikipedia

Despite using other terms than VW, the definitions refer explicitly to virtual worlds or attributes characteristic of VWs such as avatars. In sum, however, one can consider whether the somewhat confusing terminology and varying definitions have been beneficial with regard to research on VWs.

2.3 Categories of virtual worlds

To better make conceptual sense of the field, researchers have developed categorisations of virtual worlds. As with the definitions and terminology, the categorisations are somewhat diverse.

Guo and Barnes (2009) divided virtual worlds into game-oriented virtual worlds such as WoW or Everquest, and freeform virtual worlds for example Second Life and HiPiHi. Messinger et al. (2009) applied the categorisation of virtual communities by Porter (2004) and divided virtual worlds into education-focused, theme-based, community-specific, children-focused and self-determined worlds. Education-focused VWs offer things like training in a specific, area such as architecture or language. Theme-based VWs use a specific type of content, such as music, as the motivating factor to engage the members of a community. Community-specific virtual worlds are targeted e.g. at a particular country or a cultural group. For example, HiPiHi is designed for the Mandarin speaking audience. Children-focused worlds, such as Club Penguin, Poptropica, Webkinz and Habbo have content and interface suitable for minors. The fifth category

consists of self-determined virtual worlds, such as Entropia Universe and Second Life. Self-determined worlds have open purposes and a tradable currency.

Kaplan and Haenlein (2009, 566) make a distinction between game worlds with clear rules and virtual social worlds which have no restrictions on avatars' behaviour and interaction. Similarly, Jung and Kang (2010) distinguish between gaming virtual worlds and social virtual worlds based on the absence of a predetermined storyline.

Also making a distinction between game-oriented VWs and social VWs, Tikkanen et al. (2009) developed a categorisation of VWs based on two factors, the user objective and the amount of freedom in content creation (see Figure 5). Unlike game-oriented virtual worlds, social virtual worlds lack straightforward goals (Tikkanen et al., 2009, 1361). By making a distinction based on the degree of freedom in content creation by the users, virtual worlds can be further divided into static and dynamic ones. In dynamic worlds users are able to e.g. manipulate their surroundings whereas in static worlds the environment is created solely by the developers. In most VWs the developers control the gaming experience and limit the freedom to create content.

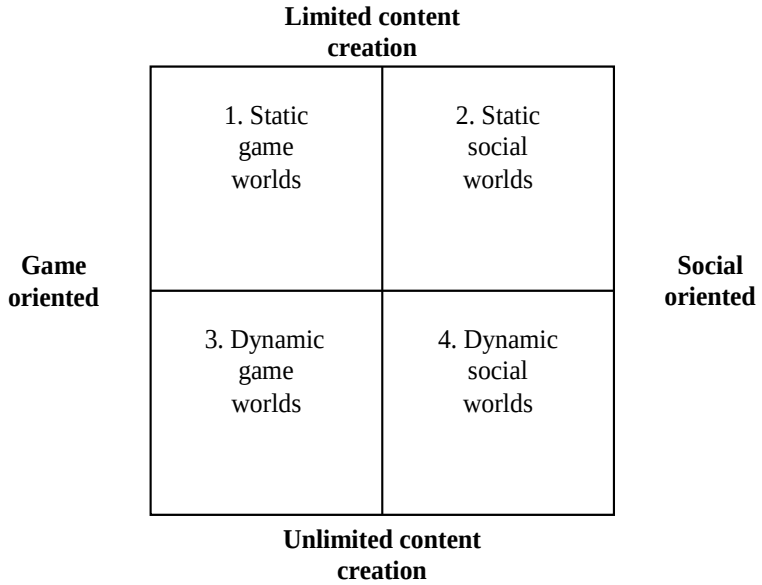

Figure 5 Categorisation of virtual worlds (Tikkanen et al, 2009)

Cagina and Poian (2009, 56) used the classification of Dougherty and Lastowka (2007) and divided VWs into game worlds, such as Everquest or

World of Warcraft (WoW), Social worlds and User-generated worlds. Game worlds, such as World of Warcraft and Everquest, have predetermined tasks for players and their content is created by developers. Social worlds such as There and Habbo use partially predetermined tasks for players and the players can customise the content created by the developers. In user-generated worlds, e.g. Second Life and Active Worlds, the tasks are self-determined and the users can create the content. However, Cagina and Poian (2009) emphasise that the boundaries are flexible.

Robbins and Butler (2009, 200) presented a taxonomy of virtual worlds based on the number of existing knowledge sources for users and the nature of the purpose of the VW (see Figure 6). The horizontal axis represents the extent to which tasks, goals and objectives are embedded in the VW. The vertical axis represents the number of information sources that are available to the VW user within the VW. Gaming worlds and emergent worlds have large social networks that the users can utilise in knowledge acquisition. In addition, there are various information resources provided by the developers, such as the prompts in WoW and tutorials in Second Life.

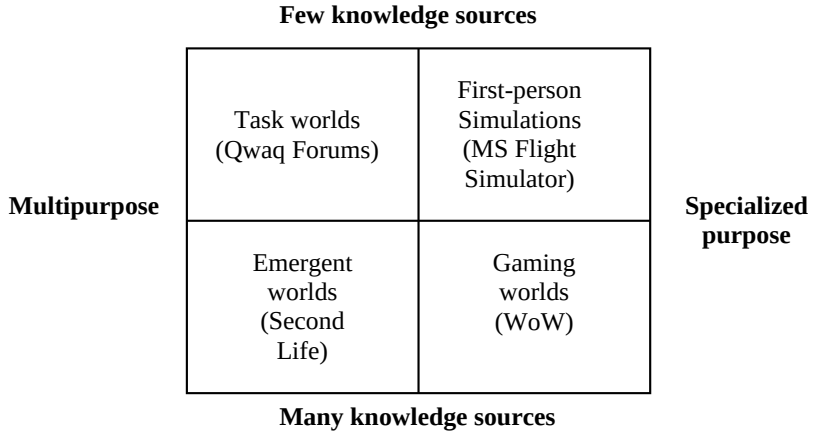

Figure 6 Virtual Worlds Taxonomy (Robbins & Butler, 2009)

According to Robbins and Butler, first-person simulations can be considered analogous to traditional computer games, whereas task worlds are environments developed specifically for virtual collaboration. In contrast to game worlds, in emergent worlds the users can act as the creators of the environment.

To sum up the categorisations presented above, one can conclude that a rather commonly used approach is to distinguish game worlds from other forms of

virtual worlds. By reflecting on their roots in the gaming context it becomes clear that virtual worlds have primarily been sorted into two main categories according to their functions: gaming virtual worlds (GVWs) and social virtual worlds (SVWs) (see Jung & Kang, 2010).

2.4 Uncovering social virtual worlds

As argued by Pinkwart & Olivier (2009, 233), in addition to gaming, recreational and social usage is a prominent application area for VWs. In practice, social and recreational usage relates to e.g. chatting and socialising with other users.

SVWs can be viewed as emerging from online communities and online games (Bartle, 2003; Messinger et al., 2009). Similarly to communities, social interaction is the core stimulus for the users. The user experience is spiced up with elements characteristic of games, such as a 3D graphic environment, sounds and music. Moreover, the users are represented with avatars that can be customised to enable the users to express themselves. However, unlike games, SVWs do not include explicit tasks, level-ups and a narrative storyline. (Jung & Kang, 2010; Messinger et al., 2009.)

The users have various ways to actually use the SVW; they can, for example, play in-world games, take part in various events organised by the operator or the members themselves. In fact, meeting new people and interacting with existing friends is the focal point of the user experience. As social virtual worlds normally have an in-world economy, they either have a tradable virtual currency that can be transferred back to real money or non-tradable credits for in-world purchasing. As a result, and based on the summarising of the categorisations and definitions of the prior literature (Bartle, 2003; Bell, 2008; Rheingold, 2000), the definition for a social virtual world is developed according to the VW definition presented in Chapter 2.2. Thus, SVW is defined in this study as:

persistent computer-mediated 3D environments, designed for entertainment and social interaction, where the users are represented as avatars.

The freedom to determine and pursue their own specific set of goals makes SVWs similar to multipurpose information appliances (Hong & Tam, 2006) that provide value to their users by delivering the tools to socialise and communicate with one another, create content, and manipulate the virtual environment, to name but a few of the possible activities. Table 4 provides an overview of a group of popular SVWs as well as their key user attractions.

Table 4 Examples of social virtual worlds

Name	***Target group***	***Catch***	***User fees***
Second Life	13– General	Content creation, virtual economy enabling doing business in the VW.	Free access Premium memberships
Entropia Universe	13– General	Gaming, virtual economy connected to real economy with an in-world currency that has a fixed exchange rate.	Free access Micro-transactions Premium memberships
Vivaty	13– Young adults	Music, logging in e.g. to a Facebook or Twitter account	Free access Micro-transactions
Habbo	Teens	31 country-specific portals, TV shows etc. replicated to the virtual environment	Free access Micro-transactions Premium memberships Advertising
Kaneva	13– Teens, young adults	Media sharing	Free access Micro-transactions Advertising
HipiHi	General	Designed specifically for the Chinese audience. In-world currency	Premium memberships Micro-transaction Advertising
Moove	Adults	Room-building Matchmaking, virtual weddings for Gold membership holders Different languages available	Free access Premium memberships
Club Penguin	Children	Games, no advertising	Free access, Subscription Merchandise
IMVU	13–	3D instant messaging Includes a music store	Free access Premium memberships
Poptropica	Children, teens 6–15	Credits from completing tasks, Cartoons	Free access Premium memberships Micro-transactions

As Table 4 illustrates, SVWs are a heterogenic group, covering various demographic groups. Consequently, the activities and key attractions for the users are somewhat different. In some services, such as IMVU, the focus is more on social interaction in the form of chatting and meeting people than exploring the virtual environment, whereas in other worlds e.g. Second Life and HiPiHi, the users can e.g. buy land and really create their own environments. Furthermore, as addressed by Spence (2008), some SVWs such as IMVU could be better described as instant messengers with avatars than as full-scale virtual worlds. (Spence, 2008) Nevertheless, IMVU falls into the SVW definition of this study.

As all the examined SVWs are commercial services, they also have a revenue model, which in most cases is based on a free basic membership and charging users for a premium account and/or other value-added services provided by the SVW operator. The listed SVWs include features designed specifically for the interest of the target audience. For example, the child-focused Poptropica includes cartoons, whereas Moove provides virtual matchmaking-services for adults. In general, avatars in SVWs targeted at adults resemble human-beings, whereas in SVWs targeted at teens and children the avatars generally look more like animated characters.

2.5 Research on social virtual worlds

To gain an overall understanding of the academic research on SVWs, a literature review was conducted. Because of the different categorisations and terminology used in the literature, the review was conducted by including all studies discussing VWs and thereafter examining whether the research provides information about SVWs. As argued by Webster and Watson (2002), conducting a literature review relying solely on keyword-based searches may leave important contributions unnoticed. Thus, Webster and Watson suggest (2002) a systematic approach ensures covering the relevant knowledge. As this research stems from the IS research tradition and is positioned to contribute primarily to IS literature, the focus of the systematic review was set on premier journals publishing contributions relevant to the IS discipline. In consequence, *Senior Scholar's Basket of Journals* by Association for Information Systems[8] was used as the selection criteria for the IS journals. The journals included in the systematic review were *MISQ Quarterly, Information Systems Research, Information Systems Journal, European Journal of Information Systems, Journal*

8 http://home.aisnet.org/displaycommon.cfm?an=1&subarticlenbr=346 (retrieved Feb 15 2010)

of Management Information Systems and *Journal of AIS*. The timeframe for the review was set between the years 2000 and 2009 thus covering a ten-year period. The systematic review revealed, as also noted by Messinger et al. (2009), that virtual worlds have thus far not been voluminously discussed in the major IS outlets. However, it must be noted that at the time of writing, there is a forthcoming special issue on virtual worlds in *MIS Quarterly*. As dedicated outlets publishing research on virtual worlds, such as *Journal of Gaming & Virtual Worlds* and *Journal of Virtual Worlds Research* exist, they were included in the systematic review, starting from their inaugural issues.

In sum, the systematic review of the premier IS outlets and the dedicated publications produced very little, the review process was continued with a keyword-based search from the EBSCOhost Complete, ProQuest ABI/INFORM and Elsevier Science Direct bibliographical databases. From the resulting pool of articles, the relevant contributions were examined in detail. Based on their reference lists, additional articles were then included in the review i.e. snowballing was applied. Due to the small amount of research focusing specifically on SVWs, the scope of the review was expanded to include both SVWs and VWs that are not specifically designed for gaming purposes but could fall into the SVW category.

Virtual worlds have started to emerge as a research area in recent years. Figure 7 illustrates the number of hits for the search term “virtual worlds” from the EBSCOhost Business Source Complete database. It is worth noting that this approach as well as the figure is rather simplistic and more of an illustrative representation, and also that the term virtual world or virtual worlds did not have the conceptual meaning it has today. In any case, the figure shows the increase of managerial interest in virtual worlds from 2006 onwards. On the other hand, the amount of academic research, has developed more steadily in terms of the number of hits.

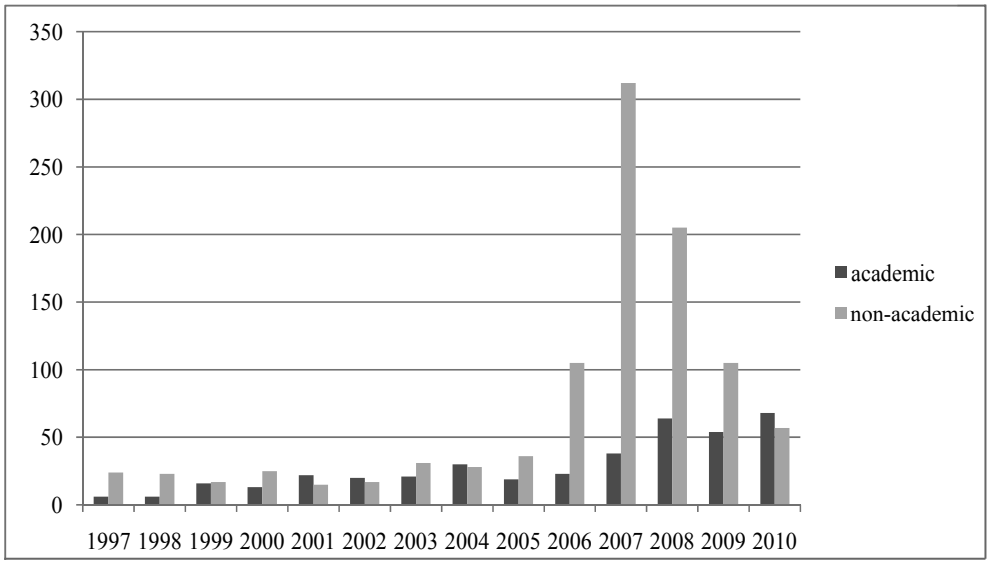

Figure 7 Hits for 'virtual worlds' from EBSCOhost Business Source Complete

Going through the literature included in the review verified that virtual worlds have recently started to attract the interest of the academic communities in various disciplines. An overview of the different perspectives taken in the VW research is attached in Appendix 1. For example, the use of VWs for education purposes has been discussed by several scholars in the literature (Eschenbrenner et al., 2008; Robbins & Butler, 2009; Shen & Eder, 2009b; Wagner & Ip, 2009). In addition, the potential of VWs for business, marketing and innovation has been discussed (Arakji & Lang, 2008; Barnes & Mattsson, 2008; Hemp, 2006; Kohler et al., 2009; Shen & Eder, 2009a; Tikkanen et al., 2009). The consumption of virtual items has been investigated from the perspective of economic sociology (Lehdonvirta, 2009a; Lehdonvirta et al., 2009). The drivers of purchasing virtual items have been explored by Guo & Barnes (2009), and the adoption of virtual currency has been examined (Shin, 2008).

As regards the methodological perspectives applied, the research has been diverse. The research examining the users of virtual worlds includes examples of qualitative (Guo & Barnes, 2009; Jung & Kang, 2010), quantitative (Fetscherin & Lattemann, 2008; Hua & Haughton, 2009; Shen & Eder, 2009a; Shin, 2009) and mixed-method (Fang et al., 2009) studies. Moreover, the literature also includes some conceptual research (Cagnina & Poian, 2009; Robbins & Butler, 2009).

According to Spence (2008) the research on VWs has been somewhat biased from a contextual standpoint. The majority of the research actives related to VWs

have been focused on Second Life. However, in terms of the demographic background of the users, Second Life, targeted towards audiences of people over 30, does not represent the whole field of VWs, since most VWs are targeted at people under the age of 20 years. Furthermore, in terms of the number of users, VWs for children and teens represent the fastest growing VW category.

To summarise the current state of the academic research around VWs as well as SVWs, one possible interpretation would be that prior research has been able to offer insights into the different areas connected to virtual worlds. Furthermore, several potential areas and issues for further research have been identified and addressed. However, very few of these areas have yet matured into clear lines of investigation.

This chapter aimed at providing an understanding of the contextual domain of the study. A characteristic feature of the area appears to be the lack of a common understanding on what VWs are. To conclude, there is something of a consensus that SVWs are a subset of VWs that focus on social interaction between their users. Moreover, the literature includes several attempts to categorise the field of VWs. The literature review also revealed that there are contributions relevant to the areas focused on in this research; continuous SVW use and purchasing behaviour. This literature is discussed within chapters three and four in order to relate it to other research on these behaviours. The following two chapters thus present a review of the literature on individual-level technology adoption, online purchasing behaviour and their respective contributions to the VW context.

3 TECHNOLOGY ADOPTION AND POST-ADOPTION

To understand the theoretical origins for examining continuous SVW use, this chapter presents a review of the literature on technology adoption. This body of literature was selected for the literature review since SVWs are, in this study, viewed as belonging to research on information systems and this stream of research provides an extensive selection of theoretical tools for investigating different aspects and perceptions related to the IT artefact.

The review starts from the initial technology acceptance or adoption since an initial adoption is a prerequisite for any post-adoption behaviour to occur. As a result, the research on post-adoption user behaviour has evolved from the stream of research examining individual-level technology adoption. Therefore the literature of technology acceptance and adoption is used as a foundation for gaining an understanding of the theoretical origins of the post-adoption research. Usage behaviour is the most widely investigated post-adoption behaviour as it is central to understanding the issues involved (see Chea & Luo, 2008). Since continuous usage is the key behaviour of interest of this study, the stream of research focusing on continuous IS use, i.e. IS continuance is included in the review.

The chapter consists of four sub-sections; after the overview given in the first subsection, some of the most influential theoretical models for explaining adoption and acceptance are presented. The third subchapter concentrates on the post-adoption behaviour, specifically continuous use. Finally, the literature investigating user adoption of VWs is presented.

3.1 Overview of individual-level technology adoption

Individual-level technology adoption has been developed as the most eminent stream of research within IS literature (Venkatesh et al., 2007, 267). The term's acceptance and adoption are both used with regard to research focusing on the process leading to the use of technology. However, certain differences in the contexts where the terms have been used can be found in the literature. Dillon & Morris (1996, 16) defined acceptance as "the demonstrable willingness to employ information technology for the tasks it is designed to support". Originally, technology acceptance research focused on cases where the users had

not yet started to use the systems or had only recently started. In this stream of research the Technology Acceptance Model (TAM) has been largely used as the theoretical foundation (Davis, 1989; Davis et al., 1989; Davis et al., 1992; Venkatesh, 2000; Venkatesh & Davis, 2000). The term adoption, on the other hand, has been used when the IT has already been implemented and is in use, referring to a perhaps somewhat more stable setting than acceptance. In this line of investigation, other theoretical tools than TAM have been used (Karahanna et al., 1999; Taylor & Todd, 1995a). Cooper and Zmud (1990) make a distinction based on the stage of the IT implementation process, where initiation, adoption, adaptation, acceptance, routinisation and infusion represent the subsequent phases in the process. The terminological differences do not appear to be very profound, or a focal point for the IS researchers, since when deliberately discussing the history, achievements and future of TAM, Venkatesh et al. (2007, 267) used the term individual-level technology *adoption* while focusing mostly on the Technology *Acceptance* Model. In this research, the terms adoption and acceptance are viewed as almost isomorphic and are used interchangeably. Since the focal area of the research is post-adoption user behaviour the term adoption is used where applicable. Here post-adoption is viewed as the subsequent stage following the user's initial adoption (or acceptance) of the technology. To underscore the importance of continued IS use in realising IS success, Bhattacherjee (2001a; 2001b) made a distinction between technology initial acceptance, i.e. first time use and continued use, referred to as continuance. As a result, continuance is one post-adoption behaviour. Respectively, the behaviours taking place in the post-adoption stage are referred to as post-adoption behaviours (Ahuja & Thatcher, 2005; Jasperson et al., 2005; Karahanna et al., 1999; Kim & Son, 2009; Spiller et al., 2007).

However, some of the research on post-adoption behaviour has examined the adoption process and thus made a deliberate distinction between the pre– and post-adoption stages (Karahanna et al., 1999), this research focuses on individuals who have already adopted the technology.

3.2 Theoretical models for individual-level technology adoption

3.2.1 Overview of models for technology adoption

The examination of individual-level technology adoption has attracted a large amount of research within IS. Table 5 presents a brief list of the models used for explaining technology adoption and examples of their applications. Presenting all the models from this stream of research is hardly possible or meaningful, instead

the purpose of the table is to provide an overview of a limited set of some of the key contributions that have shaped the technology adoption research. In any case, one can conclude that the literature offers a number of theoretical models with which to examine user adoption of technologies. In addition to the listed studies, the literature includes several contributions that have built on these theoretical approaches (Brown & Venkatesh, 2005; Kim & Malhotra, 2005; Kim, 2009).

Table 5 Overview of the models for technology adoption

Model	***Original Author***	***Applications***
Theory of Reasoned Action	Fishbein & Ajzen (1975)	Davis (1989); Karahanna et al. (1999)
Technology Acceptance Model (TAM)	Davis (1989)	Adams et al. (1992); Bhattacherjee (2001b); Gefen et al. (2003)
TAM2	Venkatesh & Davis (2000)	Chan & Lu (2004); van Raaij & Schepers (2008)
TAM3	Venkatesh & Bala (2008)	Behrend et al. (2010)
Unified Theory of Acceptance and Use of Technology (UTAUT)	Venkatesh et al. (2003)	Carlsson et al. (2006); Schaupp et al. (2010); Zhou et al. (2010)
Theory of Planned Behaviour (TPB)	Ajzen (1991)	Pavlou & Fygenson (2006); Thorbjørnsen et al. (2007)
Decomposed TPB	Taylor & Todd (1995a)	Brown & Venkatesh (2005); Hsieh et al. (2008)
Diffusion of innovations/Innovation diffusion theory (IDT)	Rogers (2003)	Agarwal & Prasad (1997); Agarwal & Karahanna (2000); Cooper & Zmud (1990); Moore & Benbasat (1991)
Post-acceptance model of IS continuance (IS continuance model)	Bhattacherjee (2001b)	Kang et al. (2009); Thong et al. (2006)
Model of PC utilisation	Thompson et al. (1991)	Venkatesh et al. (2003)
Task-technology Fit	Goodhue & Thompson (1995)	Dishaw & Strong (1999); Zigurs & Buckland (1998)

The following subsections present some of the models in detail. Innovation diffusion theory is included in the section since it is chronologically one the first

models used for technology adoption research. Furthermore, the innovation diffusion perspective represents one line of inquiry within technology adoption research. The second model to be presented is the Theory of Planned Behaviour (TPB). TPB is presented in detail since a substantial body of literature on IT adoption has either used (Mathieson, 1991) or applied (Brown & Venkatesh, 2005; Taylor & Todd, 1995a) TPB. The third line of inquiry presented focuses on TAM and its extensions, namely TAM2, TAM3 and the Unified Theory of Acceptance and the Use of Technology (UTAUT). Fourth, the Post-acceptance model of IS continuance (hereafter IS continuance model) (Bhattacherjee, 2001b) is presented to illustrate the stream of inquiry which particularly focuses on continuous IT use.

3.2.2 Innovation diffusion theory

Innovation adoption has been extensively examined in various disciplines such as marketing, organisation theory and social psychology (Abrahamson, 1991; Noam, 1992; Tornatzky & Klein, 1982; Zhu et al., 2006). Alongside TAM and its extensions and applications, the innovation diffusion and adoption research, chronologically preceding TAM has been an important line of inquiry for gaining an understanding of why people use information technology.

Innovation diffusion theory examines how innovations proceed to a usage phase (Rogers, 2003). Originating from sociology, the theory views innovation diffusion as a particular type of communication process in which messages about a new idea are passed from one member to another in a social system. Conceptually, the term diffusion relates to how an innovation diffuses to the wider population, e.g. society, whereas adoption generally relates to a more specific population, such as on organisation or an individual. IDT postulates individuals can be divided into five categories, namely innovators, early adopters, early and late majority and laggards. The definitions are based on their predisposed tendency towards adopting an innovation. (Rogers, 2003.) Agarwal and Prasad (1997) adapted the concept for the IT domain and proposed a new instrument for measuring personal innovativeness in IT (PIIT), which describes the extent to which an individual has an innate propensity toward adopting a new IT.

The theory posits that the rate of adoption is partially determined by the perceived attributes of an innovation, called innovation characteristics, and proposes several attributes potentially important across diverse innovation adoption domains (Rogers, 2003). IDT suggests five innovation characteristics that affect diffusion: relative advantage, compatibility, complexity, trialability and observability. Relative advantage is the incremental improvement gained by

the use innovation compared to its predecessor. Compatibility refers to the consistency of an innovation in relation to the current values, needs, social norms and practices as well as the prior experiences of the adopter. Complexity is the difficulty of using an innovation. Observability, reflects the degree to which the results of an innovation are observable to others. Trialability is the opportunity to experience the innovation before making the use decision. (Rogers, 2003.)

Moore and Benbasat (1991) examined individual level innovation diffusion in the IT context. They included image in the set innovation characteristics suggested by Rogers, re-labelled complexity as ease of use and divided observability into two factors, result demonstrability and visibility. Image describes the extent to which the use of an innovation is perceived as enhancing one's image or status. Results demonstrability was defined as “the tangibility of the results of using an innovation” and visibility as “the extent to which the potential adopters see the innovation as being visible in the adoption context” (Moore & Benbasat, 1991, 203). In addition to the innovation characteristics, Moore and Benbasat (1991) found that perceived voluntariness influences the adoption of new IT. Table 6 summarises the constructs of IDT developed by Moore and Benbasat (1991).

Table 6 Constructs of Innovation Diffusion Theory

Constructs	***Description***	***Source***
Image	"the extent to which use of an innovation is perceived as enhancing one's image or status"	Moore & Benbasat (1991, 195)
Relative advantage	"the degree to which an innovation is perceived as being better than its precursors"	Moore & Benbasat (1991, 195)
Results demonstrability	"the tangibility of the results of using an innovation"	Moore & Benbasat (1991, 203)
Ease of use	"the degree to which use of an innovation is being perceived difficult to use"	Moore & Benbasat (1991, 195)
Compatibility	"the degree to which an innovation is perceived as being consistent with existing values, needs and experiences of potential adopters"	Moore & Benbasat (1991, 195)
Visibility	"the extent to which the potential adopters see the innovation as being visible in the adoption context"	Moore & Benbasat (1991, 203)
Voluntariness	"the degree to which use of the innovation is perceived as being voluntary, of free will"	Moore & Benbasat (1991, 195)

In their meta-analysis of 75 diffusion articles, Tornatzky and Klein (1982) found that only relative advantage, compatibility and complexity were consistently related to innovation adoption. Similarly Agrawal and Prasad (1997) found that only relative advantage and result demonstrability have an effect on future use intention and that current usage was influenced by compatibility, visibility and trialability as well as perceived voluntariness. In a similar vein, technical compatibility, technical complexity and relative advantage have thereafter been seen as influential determinants of the adoption of innovations (Bradford & Florin, 2003). Figure 6 illustrates IDT as suggested by Moore and Benbasat (1991) in a graphic format.

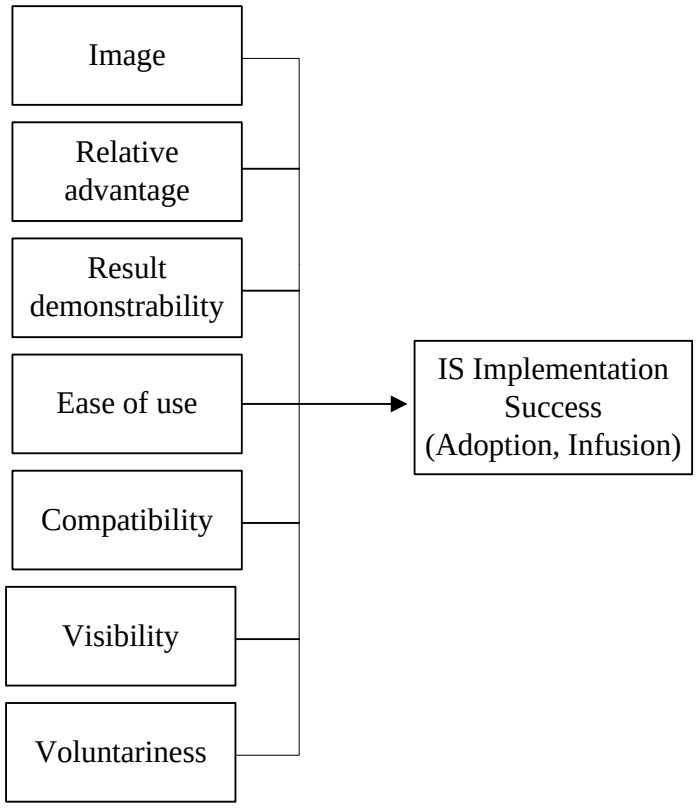

Figure 8 Innovation Diffusion Theory (Moore & Benbasat, 1991)

In contrast to technology acceptance research, innovation research has deliberately distinguished various types of usage – this is a line of inquiry where the dependent variable has been the use intention and/or its actual use – including the temporal dimension i.e. the initial usage of an innovation and sustained usage. The innovation adoption process has been described and discussed by e.g. Rogers (2003) and by Cooper & Zmud (1990) in their stage model of IT implementation.

Although they originate from somewhat different reference disciplines, TAM and IDT have similarities. First, they depart from the view that an IT artefact is a specific innovation, both theories share the view that the adoption of a particular IT is determined by its perceived attributes. Moreover, the constructs employed in TAM are fundamentally a subset of the perceived innovation characteristics; specifically, perceived usefulness and perceived ease of use are seen as conceptually similar to relative advantage and the complexity of IDT. Perceived usefulness and relative advantage both encapsulate the degree to which a user feels that the new technology is better than the one they currently use. Perceived

ease of use is the opposite of complexity. Thus TAM and IDT partially reconfirm each other's findings. As a result, the literature includes examples of integrative approaches (see e.g. Chen et al., 2002; Karahanna et al., 1999).

3.2.3 Theory of Planned Behaviour

Originating from TRA, the theory of planned behaviour (TBP) (Ajzen, 1985; Ajzen, 1991) is determined by the intention to perform the behaviour. The behavioural intention is, in turn, determined by an attitude towards the behaviour, subjective norms and perceived behavioural control. In addition, TPB views perceived behavioural control as having a direct effect on behaviour. The inclusion of th eperceived behavioural control construct is TPB's main difference to TRA.

In TPB, the attitude towards behaviour is seen as a function of behavioural beliefs and outcome expectations. Subjective norms, in turn, are seen as a function of normative beliefs and the motivation to comply. Normative beliefs are the perceived opinions of the persons or groups potentially important to the individual, whereas the motivation to comply reflects the importance attached to a specific referent. Perceived behavioural control refers to the presence or absence of the requisite resources and opportunities necessary to perform a specific behaviour. PBC is determined by control beliefs, i.e. the perceived availability of e.g. skills and resources, whereas perceived facilitation is the evaluation of the importance of these resources. (Ajzen, 1991) To gain a deeper and more specific understanding of the determinants of attitudes, subjective norms and perceived behavioural controls, researchers have deconstructed the underlying belief constructs (Brown & Venkatesh, 2005; Hsieh et al., 2008; Taylor & Todd, 1995a; Venkatesh & Brown, 2001). The model that includes the deconstructed belief constructs is referred to as Decomposed TPB (DTPB). Table 7 summarises the core constructs of TPB.

Table 7 Constructs of Theory of Planned Behaviour

Construct	***Definition***	***Source***
Attitude toward behaviour	"an individual's positive or negative feelings (evaluative affect) about performing the target behaviour"	Fishbein & Ajzen (1975, 216)
Subjective norms	"the person's perception that most people who are important to him think he should or should not perform the behaviour in question"	Fishbein & Ajzen (1975, 203)
Perceived behavioural control	"perceptions of internal and external constraints on behaviour" "the perceived ease or difficulty of performing the behaviour"	Taylor & Todd (1995b, 149) Fishbein & Ajzen (1975, 188)

The applicability of TPB has been proven in various studies focusing on technology adoption. (Brown & Venkatesh, 2005; Mathieson, 1991; Pavlou & Fygenson, 2006; Taylor & Todd, 1995b). In addition, the literature includes comparisons of TAM and TPB (Mathieson, 1991; Taylor & Todd, 1995b; Venkatesh et al., 2003). Compared to the more parsimonious TAM, TPB has been found to provide a better explanatory power (Huh et al., 2009; see e.g. Taylor & Todd, 1995b). TPB is illustrated in Figure 9.

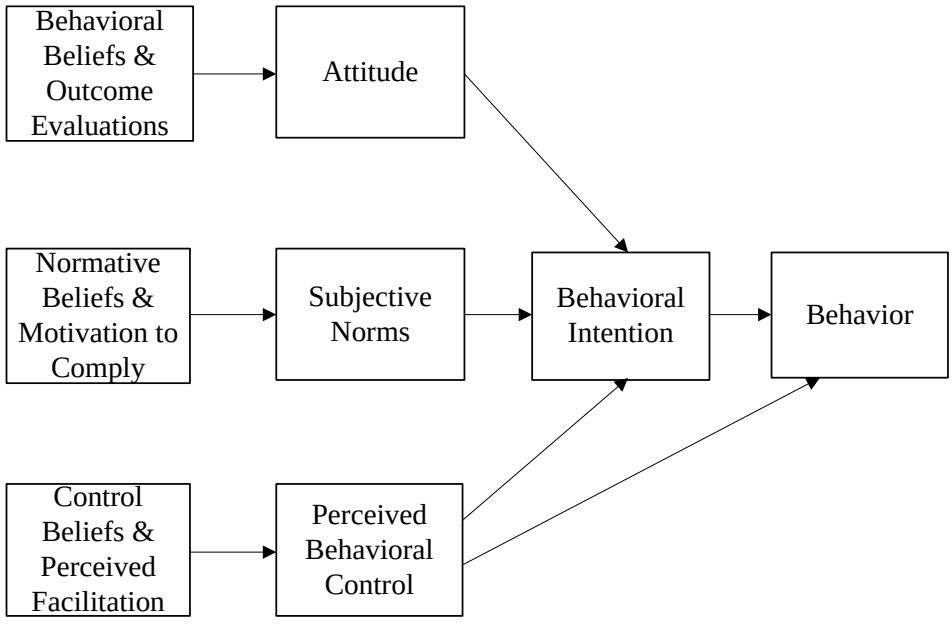

Figure 9 Theory of Planned Behaviour (Ajzen, 1991)

The main advantage of TPB over TAM is that TPB takes into account social influences and perceived behavioural control. Furthermore, congruent with TRA, TPB posits that attitudes fully mediate the effect of behavioural beliefs. However, this full mediation has been somewhat debatable in the literature (Davis et al., 1989; Karahanna et al., 1999; Venkatesh et al., 2003).

3.2.4 Technology Acceptance Model

TAM (Davis, 1989; Davis et al., 1989) has been the most influential theoretical tool for explaining the user acceptance of technology in terms of numbers of the citations it has received (Venkatesh et al., 2007). In fact, TAM has been claimed to have become so influential that its pre-eminence has led scholars to discuss whether it has reached a paradigmatic position (Benbasat & Barki, 2007) and led to other important aspects of technology adoption behaviour being ignored or unnoticed (Lee et al., 2003) .

Grounded on the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) TAM views perceived usefulness and perceived ease of use as the most salient beliefs affecting the decision of an individual to accept new technology. The constructs of TAM are presented in Table 8.

Table 8 Constructs of Technology Acceptance Model

Construct	***Definition***	***Source***
Perceived usefulness	"the degree to which a person believes that using a particular system would enhance his or her job performance"	Davis (1989, 420)
Perceived ease of use	"the degree to which a person believes that using a system would be free of effort"	Davis (1989, 420)
Attitude towards behaviour	"an individual's positive or negative feelings (evaluative affect) about performing the target behaviour"	Fishbein & Ajzen (1975, 216)

Similarly to TRA, TAM is an intention-based model that views behavioural intention as the best predictor of actual behaviour and attitude as the predictor of behavioural intention. Attitude, in turn, is seen as a function of the salient beliefs, perceived usefulness (PU) and perceived ease of use (PEOU). However, in contrast to TRA, Davis did not include social influence i.e. subjective norms in TAM. When further testing the original TAM, Davis et al. (1989) found attitude to have only a partial mediating effect, and suggested excluding attitude from the latter version of the model. TAM is presented in the following Figure 10.

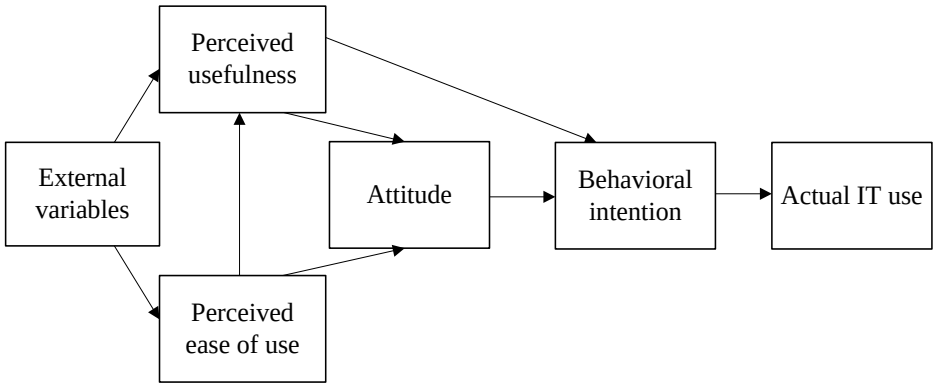

Figure 10 Technology Acceptance Model (Davis, 1989)

Thereafter, an extensive body of literature has been published to revise TAM or test its applicability in different settings (Adams et al., 1992; Gefen et al., 2003; Mathieson, 1991; Moon & Kim, 2001; Sun & Zhang, 2006; Szajna, 1996). As argued by Gefen et al. (2003) TAM has proven robust and parsimonious in both organisational (Hu et al., 1999; Venkatesh & Morris, 2000) and non-organisational settings (Agarwal & Karahanna, 2000; Mathieson, 1991), among experienced and inexperienced users (Taylor & Todd, 1995b) as well as across different cultural contexts (Straub & Keil, 1997). Moreover, the role of gender and social influence on the technology acceptance model has been examined (Venkatesh & Morris, 2000). Also meta-analyses examining the relationships between the constructs of TAM have been conducted (Legris et al., 2003; Schepers & Wetzels, 2007).

Even though perceived usefulness and ease of use have been found to be consistent determinants of technology acceptance, additional variables that better grasp the use context have been included to increase the predictive power. TAM has been extended with e.g. intrinsic motivation control, emotion (Venkatesh, 2000) perceived enjoyment in the context of hedonic information systems (van der Heijden, 2004), trust (Gefen et al., 2003; Pavlou, 2003) and risk in the e-commerce setting (Pavlou, 2003) and perceived playfulness in the context of the World Wide Web (Moon & Kim, 2001), to name but a few. Despite its crucial role and profound influence in shaping the research on individual-level technology adoption, or maybe because of it, TAM has also been criticised for e.g. viewing perceived usefulness and ease of use as ‘black boxes’ and narrowing the researchers’ view of the factors influencing other potential determinants of the user acceptance of technology (Benbasat & Barki, 2007).

An important aspect of TAM is that it has acted as a foundation for subsequent models. In the following subsections, three models built on TAM, namely TAM2 and 3 and UTAUT are presented.

3.2.5 TAM2

TAM2 was developed from the original TAM to include additional key antecedents of perceived usefulness and use intention and to examine how increased experience with the target system affects these constructs. Thus, TAM2 builds on TAM by encompassing the social influence, namely subjective norms from TRA, as well as components from IDT image and voluntariness, and the cognitive instrumental processes from job relevance, output quality, result demonstrability and perceived ease of use (Venkatesh & Davis, 2000). Table 9 summarises the 'new' constructs of the constructs and definitions in TAM2.

Table 9 Constructs of TAM2

Construct	***Definition***	***Source***
Job relevance	"individual's perception regarding the degree to which the target system is relevant to his or her job"	Venkatesh & Davis (2000, 191)
Output quality	the degree to which an individual believes that the system performs his or her job tasks well	Venkatesh & Davis (2000, 191)
Subjective norm	"person's perception that most people who are important to him think he should or should not perform the behaviour in question"	Fishbein & Ajzen (1975, 203)

Experience and voluntariness are viewed as moderators in TAM2. The model was empirically tested in four longitudinal settings. In empirical testing TAM2 was found to explain 40 % to 60 % of perceived usefulness and 34 % to 52 % of the use intention. In the testing, subjective norms were found to have a direct influence on the use intention for mandatory, but not voluntary, use contexts.

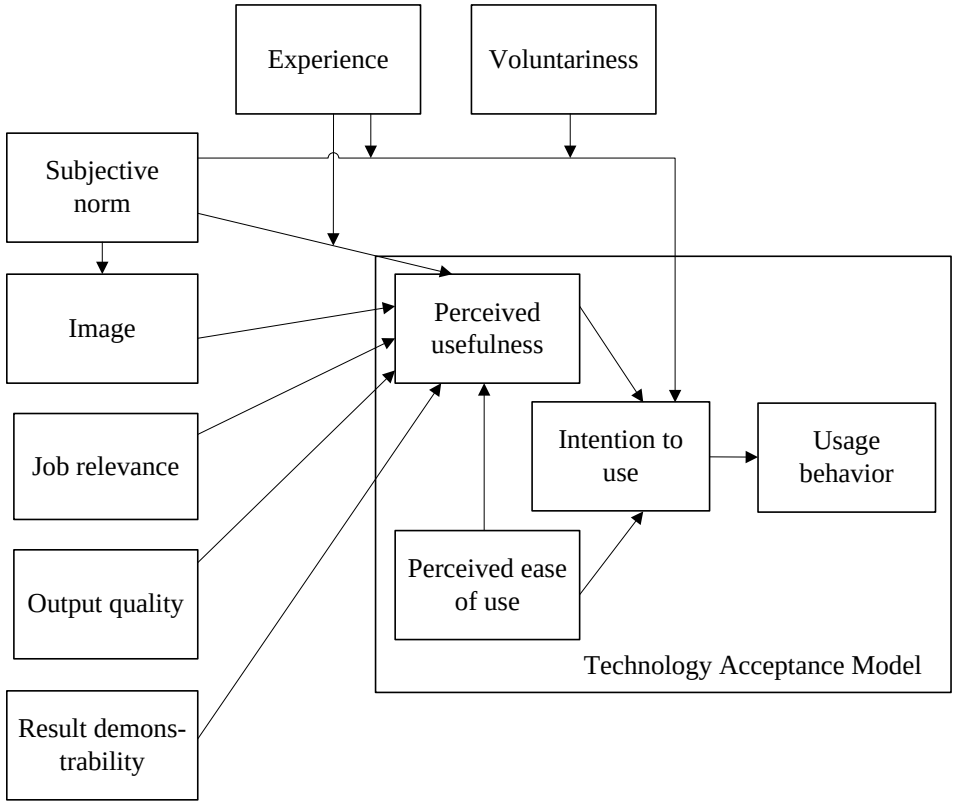

Figure 11 Technology Acceptance Model 2 (Venkatesh & Davis, 2000)

As it incorporates several new variables into the model and explicitly takes into account the effect of social influence, TAM2 can be viewed as a broad-based tool to examine the determinants that make a system become perceived as being useful. Thus the second step in the evolution of TAM was extending the investigative locus towards the factors contributing to PEOU.

3.2.6 TAM3

The 2008 extension to TAM, called TAM3 by Venkatesh and Bala (2008) was built on TAM2 but incorporates computer self-efficacy, perceptions of external control, computer anxiety, computer playfulness, perceived enjoyment and objective usability as the determinants of PEOU (Venkatesh, 2000). The definitions of the 'new' constructs incorporated in TAM3 are presented in Table 10.

Table 10 Constructs of TAM3

Construct	***Definition***	***Source***
Computer Anxiety	"the degree of an individual's apprehension, or even fear, when she/he is faced with the possibility of using computers"	Venkatesh (2000, 349)
Computer Playfulness	"the degree of cognitive spontaneity in microcomputer interactions"	Webster & Martocchio (1992, 204)
Perceived Enjoyment	"the extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use"	Venkatesh (2000, 351)
Objective Usability	"a comparison of systems based on the actual level (rather than perceptions) of effort required to complete specific tasks"	Venkatesh (2000, 350−351)

In TAM3, experience was proposed in order to moderate the influence of computer anxiety on PEOU and the impact on PEOU on PU and behavioural intention. Furthermore, TAM3 incorporated two psychological processes of decision making, anchoring and adjustment as the determinants of PU and PEOU. TAM3 is presented in Figure 12. When compared to the more parsimonious original TAM, the strength of TAM3 can be seen as resting on its comprehensiveness, according to Venkatesh and Bala (2008).

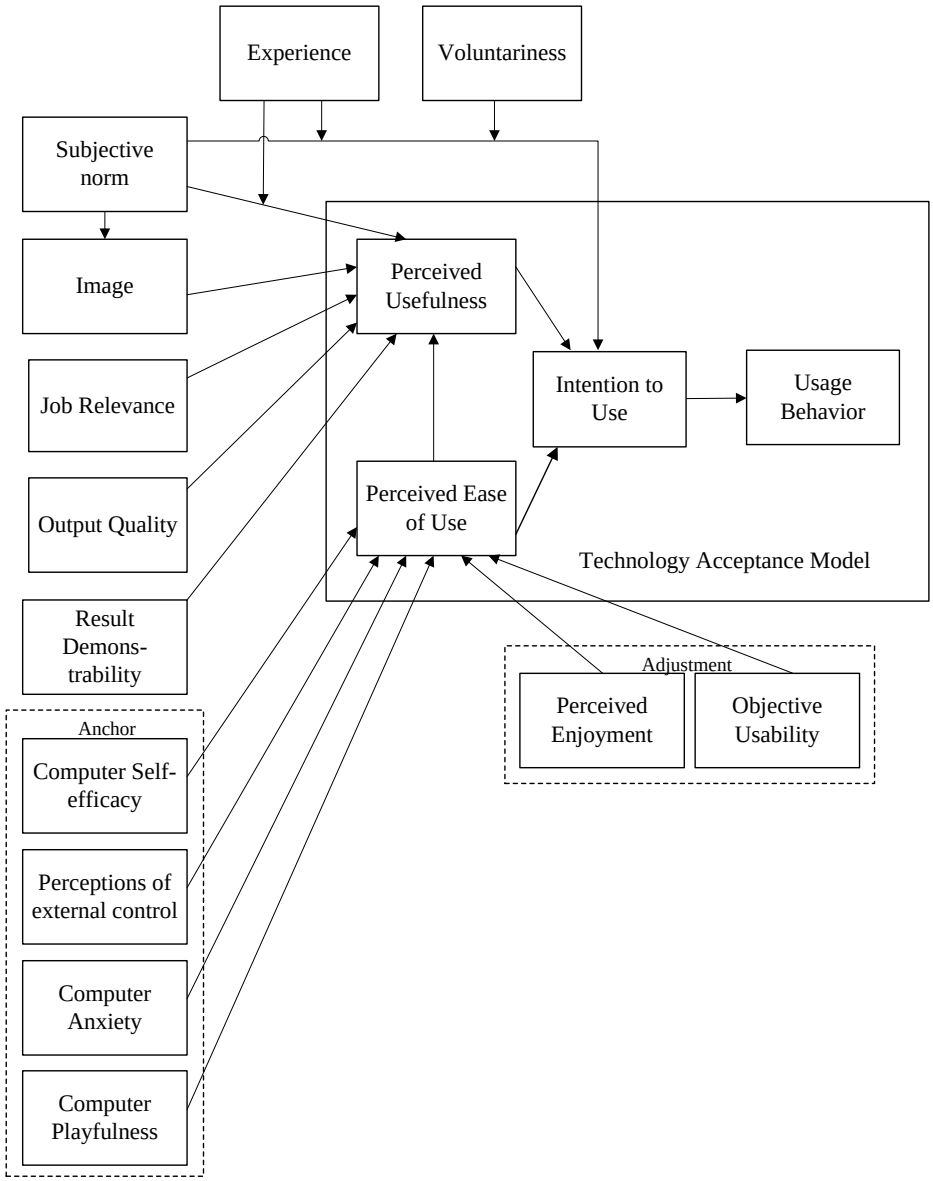

Figure 12 Technology Acceptance Model 3 (Venkatesh & Bala, 2008)

In addition to presenting and empirically testing TAM3, Venkatesh and Bala (2008) suggest a set of pre and post-implementation interventions that can influence the factors that allow a system to be perceived as useful and easy to use. Through this mechanism, the interventions are claimed to help achieve an increased acceptance and utilisation of IT.

3.2.7 Unified Theory of Acceptance and Use of Technology

Venkatesh et al. (2003) reviewed the technology adoption literature based on an empirical comparison of eight models predicting use intention: TRA, TPB, TAM/TAM2, IDT, combined TAM and TPB, TPB and decomposed TPB (DTPB), the Model of PC utilisation and the Motivational model. Synthesising the prior research Venkatesh et al. (2003) developed the Unified Theory of the Acceptance and Use of Technology (UTAUT). The constructs of UTAUT are presented in Table 11.

Table 11 Constructs of UTAUT

Construct	***Definition***	***Source***
Performance Expectancy	"the degree to which an individual believes using the system will help him of her to attain gains in job performance"	Venkatesh et al. (2003, 447)
Effort Expectancy	"the degree of ease associated with the use of the system"	Venkatesh et al. (2003, 450)
Social Influence	"the degree to which an individual perceives that important others believe he or she should use the new system"	Venkatesh et al. (2003, 451).
Facilitating Conditions	"the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system"	Venkatesh et al. (2003, 453)

In UTAUT, performance and effort expectancy, social influence and facilitating conditions are positioned as the determinants of usage intention whereas gender, age, experience and voluntariness moderate their effect. As can be seen from Table 11, the performance and effort expectancy constructs are adopted from TAM. UTAUT is presented in Figure 13.

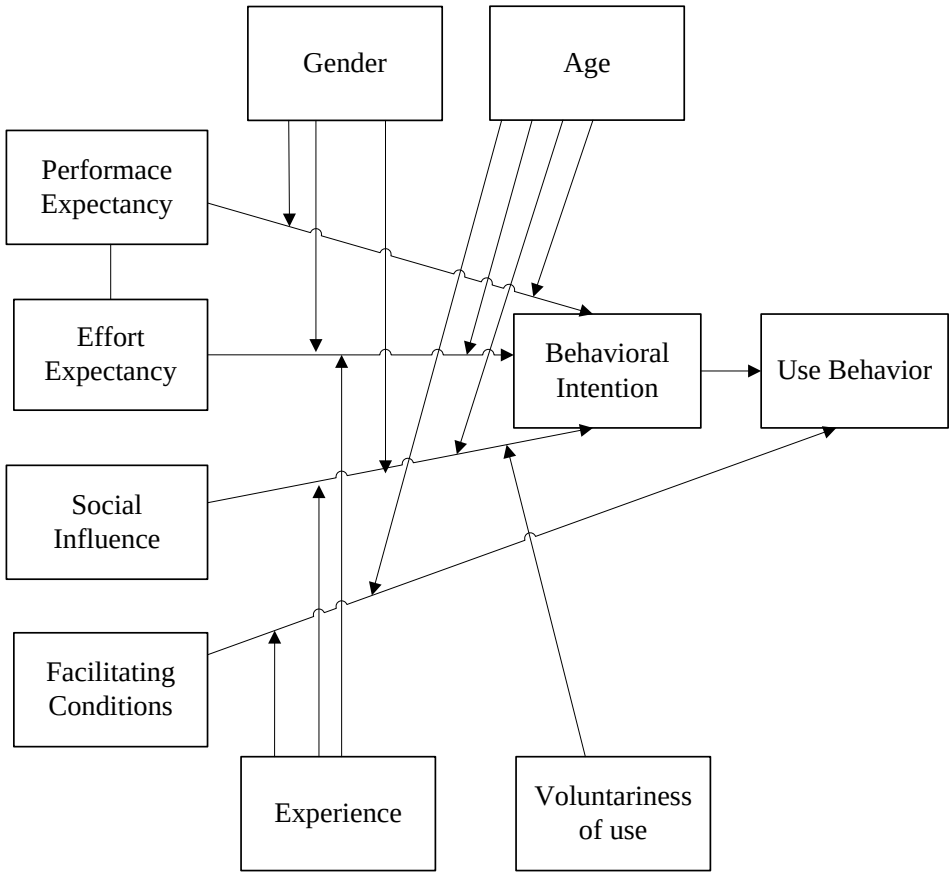

Figure 13 Unified Theory of Acceptance and Use of Technology (Venkatesh et al., 2003)

In empirical testing, UTAUT was found to yield an explanatory power of 69 percent for use intention, which outperforms the theories it was based on, where the explanatory power was 52 percent at its highest (Venkatesh et al., 2003).

3.2.8 IS continuance model

The fact that the benefits from ICT investments in the organisations materialise only through sustained usage has been widely addressed in the IS literature (Bhattacherjee, 2001b; Kim & Malhotra, 2005; Parthasarathy & Bhattacherjee, 1998). To examine continued IS use Bhattacherjee (2001b) developed the expectation-confirmation model (ECM). The model's theory originates from TAM and expectation-(dis)confirmation theory, which comes from marketing (see e.g. Churchill & Surprenant, 1982; Oliver & Linda, 1981). The ECM posits

that an individual's intention to continue IT usage is dependent on three variables: 1) the user's level of satisfaction with the IT; 2) the extent of a user's confirmation of expectations, and 3) post-adoption expectations, represented by perceived usefulness. The constructs of ECM are presented in Table 12.

Table 12 Constructs of IS continuance model

Construct	***Definition***	***Source***
Confirmation	"users' perception of the congruence between expectation of use of the IS and its actual performance" (operational definition)	Bhattacherjee (2001b, 359)
Satisfaction	"users' affect with (feelings about) prior use of the IS" (operational definition)	Bhattacherjee (2001b, 359)
IS continuance intention	"users' intention to continue using the IS" (operational definition)	Bhattacherjee (2001b, 359)

Drawing on the theory of cognitive dissonance (Festinger, 1957), the ECM postulates that confirmation has a positive influence on perceived usefulness, since users adapt their future expectations based on their prior experiences. The direct influence of perceived usefulness on the behavioural intention is grounded on the findings from the technology acceptance literature.

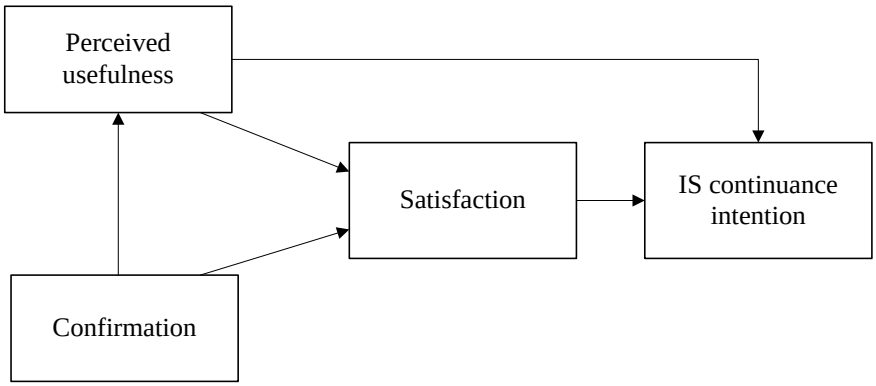

Figure 14 IS continuance model (Bhattacherjee, 2001b)

Bhattacherjee (2001) empirically found satisfaction accounted for 32 % of the variance in continuance intention. Together PU and satisfaction yielded an explanatory power of 41 %. An interesting finding was that PU and confirmation explained only 33 % of satisfaction, suggesting that the ECM should be substantiated with additional variables. Thus, a stream of research has emerged to

extended and substantiate the IS continuance model. The following subsection discusses this literature in more detail.

3.3 Post-adoption behaviour

In order to materialise the benefits from IT investments in organisations, the importance of their sustained use after initial adoption is paramount. This issue has been increasingly addressed in the IS literature (Bhattacherjee, 2001b; Kim & Malhotra, 2005; Parthasarathy & Bhattacherjee, 1998). From a slightly different perspective, customer retention has also been found to be essential for the success of online businesses (Parthasarathy & Bhattacherjee, 1998; Reichheld, 2000). Another important issue is the importance of repetitive purchasing and customer loyalty, which has been voluminously discussed in marketing literature (Dick & Basu, 1994; Helgesen, 2006; Helgesen, 2006; Oliver, 1999; Shankar et al., 2003).

System use has been the key behaviour of interest in IT adoption research, and usage behaviour has been the most widely examined post-adoption behaviour.

A considerable amount of research has extended the IS continuance model by introducing additional variables. Thong et al. (2006) incorporated perceived enjoyment and ease of use, while Lin et al. (2005) added computer playfulness to the expectation-confirmation model. Limayem et al. (2007) substantiated the IS continuance model by investigating the role of habit in continuous use. Following the same rationale, but from a different perspective Kim et al. (2007) argued that in contexts outside organisational IT use, factors other than cognition-oriented factors may be important in IT use decisions. They examined the role emotional constructs play in continued IT use and in incorporated pleasure and arousal in the IS continuance model. In the mobile services context, pleasure, attitude and perceived usefulness were found to be the predictors of use intention (Kim et al., 2007).

Regret and self-image congruity was included by Kang et al. (2009). However, in empirical testing, regret was found to be the strongest predictor of continuance intention whereas self-image congruity had only a weak effect. Kang & Lee (2010) examined website system satisfaction and website information satisfaction and found them to be influential contributors in online service continuance. However, their model did not include confirmation.

Larsen et al. (2009) integrated Task-technology fit into the IS continuance model. In doing so they found that continuance intention can be predicted by two distinct paths, the work system-centric path through utilisation and the IT-centric path through user satisfaction.

In addition to the extensions and adaptations of the IS continuance model, continuous use has also been investigated with alternative theoretical lenses such as TPB (Hsieh et al., 2008; Liao, 2007) and expectation-(dis)confirmation theory (Chea & Luo, 2008). A summary of the post-adoption literature examining continuous use from different theoretical perspectives is presented in Appendix 2.

Hong et al. (2006) compared TAM with the expectation-confirmation model and an extended expectation model incorporating perceived ease of use. The extended expectation-confirmation model was found to have the strongest explanatory power and was followed by TAM and the expectation-confirmation model. Hong et al. concluded that TAM is the most parsimonious model and that it provided almost equal explanatory power (63%) to the extended expectation-confirmation model (67%) and thus suggested that TAM could be an applicable tool for predicting continued usage behaviour.

Premkumar and Bhattacherjee (2008) empirically compared TAM with expectation-(dis)confirmation theory and a hybrid model that has PU, PEOU and satisfaction as the determinants of use intention. The hybrid model was found to have an R^2 of 73%, which provides a statistically significant increase in the explanatory power of use intention when compared to TAM (R^2=69%) or expectation-(dis)confirmation theory (R^2=50%).

Continuous use has also been examined by focusing on the differences between the pre-adoption stages developed by Karahanna et al. (1999), which used TRA as its theoretical tool. Perceived usefulness was found to be the only consistent determinant of both adoption and the continuous use intention among Windows users. Subjective norms were found to be the predictor of the intention to adopt, whereas the intention to continue using was determined by attitude and voluntariness (Karahanna et al., 1999, 197).

From a contextual perspective, a considerable degree of the research on post-adoption behaviour has focused on the organisational context (e.g. Ahuja & Thatcher, 2005; Jasperson et al., 2005). For this reason, Kim and Son (2009) have argued that the literature offers less insight into online consumer behaviour.

In the reviewed literature, TAM has been widely used as the nomological core on which researchers have then built a more exact theoretical framework (see e.g. Bhattacherjee, 2001b; Chao-Min Chiu et al., 2009; Thong et al., 2006). In this sense, the research has evolved in a similar way to that of the stream of literature extending TAM into initial technology adoption.

To take the literature review closer to the domain interest of this study, the last subsection of the chapter focuses specifically on the literature that examines adoption and post-adoption behaviour in the virtual world context.

3.4 User adoption of virtual worlds

Table 13 presents a summary of the literature examining the use and adoption of VWs. The table reveals that such literature is relatively scant. TAM (Davis, 1989) has been the dominant theoretical framework and it has been complemented with additional components (see e.g. Hua & Haughton, 2009; Shin, 2009).

As regards the explanatory power of the core constructs of TAM – perceived ease of use and perceived usefulness, the studies have verified perceived usefulness as being an important determinant of VW adoption, whereas the results regarding perceived ease of use have been somewhat mixed (Fetscherin & Lattemann, 2008; Shen & Eder, 2009a; Shen & Eder, 2009b).

In addition to perceived usefulness and ease of use, attitude has been found to be a predictor of use intention (Hua & Haughton, 2009; Shin, 2009). Moreover, the role of hedonic motives has been examined in the literature. Shen & Eder (2009a) found hedonic motives, i.e. perceived enjoyment, has a direct positive impact on the use intention, whereas in Shin's (2009) study on the users of Second Life, the perceived enjoyment had a significant impact on attitude, but did not directly affect usage intention.

The goals for VW participation have also been examined using the means-end-chain approach (Jung & Kang, 2010). Social relations e.g. meeting people, chatting and amusement, for example gaming and music are important factors underpinning SVW use. In addition, satisfying one's creativity by creating virtual items or decorating the virtual environment was found to be a reason for SVW use. The technical features characteristic of SVWs such as a 3D environment and human-like avatars were found to be important aspects for facilitating the reaching of goals related to social relations and amusement.

Individual motivations and demographic differences with respect to using Second Life have been investigated by Zhou et al. (2011). Zhou et al. distinguished between utilitarian, hedonic and social factors with regard to motivating participation.

Iqbal et al. (2010) explored the activities upper-secondary school students conduct in virtual worlds and found that social relationships are important for users.

Table 13 Examples of the literature of virtual world adoption and use

Study	***Theoretical framework***	***Method & sample***	***Key findings***
Jung & Kang (2010)	n/a	Means-end chain n=4	Social relations and amusement are the main goals
Hua & Haughton (2009)	TAM +IDT + flow	SEM n=108	Attitude and subjective norms are the determinants of usage intention
Fetscherin & Lattemann (2008)	TAM	SEM n=249	Perceived usefulness is the main driver of intention, followed by perceived ease of use. Attitude towards technology and perceived community functions are relevant determinants of PU.
Shen & Eder (2009a)	TAM + perceived enjoyment + antecedents of PEOU	SEM n=77	PU is the main determinant of use intention, followed by perceived enjoyment. PEOU has a non-significant effect-
Shen & Eder (2009b)	TAM + playfulness + Antecedents of PEOU	SEM n=77	PU alone explained 65 % of the variance in the use intention to use Second Life for education.
Shin (2009)	TAM + flow	SEM n=274	Flow and attitude are the main determinants of the intention to use Second Life.
Zhou et al. (2011)	Uses & gratifications theory	Content analysis n=188	Female users are inclined to use Second Life for shopping, researching and exploring; young users prefer entertainment; experienced users are more likely to use Second Life for creating, education and commerce.
Iqbal et al. (2010)	n/a	Qualitative case study n=15	Chatting and doing things with friends were the most frequently mentioned activities

The current state of research on VW adoption is perhaps characteristic for a new area that has only recently started to draw academic interest. Therefore, the literature mostly includes studies that have tested the applicability of TAM with some extensions in the VW setting.

This chapter provided a review of the research on individual-level technology adoption, its development and current state by focusing on post-adoption behaviour. To conclude the main findings of the chapter, prior research offers several theoretical tools for examining technology adoption that also includes the post-adoption stage. When looking at the individual-level technology adoption literature, specifically the research based on TAM, one can identify three main lines the research has attempted to substantiate. First, TAM has been extended with additional variables to capture such factors as subjective norms and perceived behavioural control. Secondly, complementing or substituting beliefs e.g. compatibility and visibility have been incorporated into the TAM framework. Third, external moderating variables such as gender and voluntariness have been included. (Wixom & Todd, 2005.)

Moreover, from a somewhat wider perspective, the trend seems to be towards more complex models integrating different theoretical frameworks as well as attempts to better grasp the specific features related to the IT artefact examined. Finally, the literature has paid increasing attention to the phases that follow initial user adoption. In the research on post-adoption behaviour, continuous use has been the most extensively examined form of behaviour. As regards research on the use and adoption of VWs, the literature is scant and largely applies TAM as the core of the research models.

To conclude the chapter, it can be said that the reviewed prior technology adoption literature offers several potential perspectives for examining the drivers of continuous SVW use. Alongside and complementing the study of continuous use, the second behavioural interest of this study is purchasing. Thus, the following chapter presents a review of the literature examining online purchasing behaviour.

4 ONLINE PURCHASING BEHAVIOUR

The second behaviour of interest of the study is purchasing behaviour in social virtual worlds. Purchasing virtual items and services can be viewed as a subset of online purchasing behaviour, which, in turn, is a form of online consumer behaviour. As a result, this chapter presents a review of online purchasing behaviour. The reason for reviewing online purchasing behaviour literature rather than focusing specifically on research on purchasing in virtual worlds is that the research on purchasing behaviour in virtual worlds is its infancy. Thus, the amount of relevant literature is also relatively small. The chapter consists of three subsections. The first subsection gives an overview of the different behaviour investigated under the umbrella of online consumer behaviour. Thereafter the prior research on online purchasing and shopping is presented. The chapter concludes with a summary of the literature and discusses purchasing behaviour in the VW context.

4.1 Overview of online consumer behaviour

Compared to the technology acceptance and continuance literature presented in the previous chapter, the field of online consumer behaviour literature is somewhat more challenging to grasp. First, while the technology adoption literature has largely concentrated on a relatively limited set of user behaviours, mainly the use intention or actual use, the body of research to do with online consumer behaviour has focused on a wider array of behavioural and attitudinal responses. Secondly, the academic discussion on technology adoption largely stems from the IS research tradition and the discussion takes place at IS outlets. Online consumer behaviour research, on the other hand, has more of a multi-disciplinary nature, the main reference disciplines being marketing and IS but also e.g. economics and social psychology. Therefore, also the discussion around online consumer behaviour takes place across several outlets. To illustrate this and to identify some of the relevant outlets, a keyword-based search in the EBSCOhost Complete biographical database was conducted using ‘online consumer behaviour’ as a search term. The results were limited to full-text academic publications. The search returned 30 articles of which six have appeared in top-tier outlets, such as *MIS Quarterly*, *Information Systems Research*, *Journal of Marketing*, *Marketing Science* and *Management Science*.

This can be viewed as an indication of the relevance of online consumer behaviour as a topic of research.

Table 14 illustrates the range of different focal behaviours investigated in prior research. Whilst not being an exhaustive representation of all the literature in the field, it aims to give an understanding of the examined areas and theoretical frameworks used. With respect to the articles presented in the table it is worth noticing that some have investigated more than one behaviour (Chea & Luo, 2008; Kim & Son, 2009; Pavlou & Fygenson, 2006). As can be seen from the table, constructs other than behavioural constructs have been positioned as the dependent variable (Childers et al., 2001; McKinney et al., 2002).

Table 14 Overview of behaviours examined in the literature

Dependent variable	***Key Constructs***	***Article***
Purchase/shopping Intention	TAM + trust + enjoyment + e-shopping quality	Ha & Stoel (2009)
Actual purchasing	Trusting beliefs + attitude –> intention –> actual purchase behaviour	Sia et al. (2009)
Satisfaction	Expectation-disconfirmation + info quality and systems quality	McKinney et al. (2002)
Attitude	TAM + intrinsic motivation	Childers et al. (2001)
Word-of-mouth	Expectation-dis(confirmation) + PU+ positive and negative affect	Chea & Luo (2008)
Loyalty/return/ repurchase intention	Satisfaction+ PU moderated with habit TRA + commitment + social influence	Khalifa & Liu (2007) Thatcher & George (2004) (loyalty)
Information search	Extended TPB	Pavlou & Fygenson (2006)
Trusting intentions	Competence + benevolence + integrity related reputation information	Fuller et al. (2007)
Inattentiveness to alternatives	Dedication and constraint based mechanism	Kim & Son (2009)
Frequency of Online shopping cart use	Intrinsic/extrinsic motivation + informativeness + price promotions Purchase frequency as the final dependent Purchase intention drives frequency of online shopping cart use as well as purchase frequency	Close & Kukar-Kinney (2010)
Willingness to provide personal information	An extended privacy calculus model; Internet privacy concerns, Internet trust, personal Internet interest, perceived Internet privacy risk	Dinev & Hart (2006)
Flow	Hoffman and Novak's model of flow (1996)	Novak et al. (2000)

As Table 14 illustrates, models originating from social psychology, such as TRA, TPB and TAM (Pavlou & Fygenson, 2006; Pavlou, 2003), as well as expectation-(dis)confirmation theory (ECT), which has extensively employed within consumer behaviour research, have been used as theoretical lenses to examine online consumer behaviour (Chea & Luo, 2008). In addition, the

literature includes several examples of studies applying components from various other theoretical origins, such as ECT and the DeLone and McLean model (1992).

4.2 Research on online purchasing behaviour

In addition to the research examining different behaviours, i.e. the dependent variables, the research that focuses on independent variables has been extensive. In this subsection the focus is on the determinants of purchasing behaviour.

In their review of online consumer behaviour literature, Cheung et al. (2005, 6) have categorised the determinants of online purchasing behaviour into factors relating to the consumer, the environment, the product/service, the medium in which the interaction between the exchange parties occurs, i.e. the website, and finally factors relating to the online store or marketplace (see Table 15). Yet the list is not exhaustive and alternative categorisations could be presented, it nevertheless reflects the multitude of factors found to have an influence on online consumer behaviour.

Table 15 Determinants of online consumer behaviour (Cheung et al., 2005)

Individual/consumer characteristics	Attitude Demographics Flow Motivation Perceived Risk Personal Innovativeness Satisfaction Trust
Environmental influences	Exposure Perceived Behavioural Control Subjective Norms Product/Service Characteristics Price Product Knowledge Product Type
Medium Characteristics	Convenience Ease of Use Information Quality Navigation Security Shopping Aids Usefulness
Merchant and Intermediate Characteristics	Brand Privacy and Security Control Service Quality

The e-commerce adoption perspective has been a common approach for examining online purchasing. In the reviewed literature, online purchasing behaviour has largely been viewed as an outcome of e-commerce adoption. In the e-commerce context, purchasing behaviour can be considered perhaps the most crucial behavioural response since the revenue is generated from purchases. Online purchase and shopping behaviour has also been one of the most extensively investigated forms of online consumer behaviour (Gefen et al., 2003; Koufaris, 2002; Novak et al., 2000; Pavlou et al., 2007; Schlosser, 2006).

Table 16 presents a brief overview of the research examining online purchasing and shopping behaviour. The articles have been selected to focus deliberately on online shopping or purchasing intention, or the respective behaviours as the dependent variable. The first six articles represent more recent contributions. The first ten 10 articles have been selected from among the 21 most cited articles in the ISI Web of Knowledge using the search terms ‘online purchasing’, ‘online purchase behaviour’, ‘online shopping’, ‘online shopping

behaviour', 'Internet' AND 'shopping', 'Internet' AND 'purchasing'. The purpose of examining the most cited articles was to identify and elaborate on the most influential contributions in the field and hence also ensure the validity of the literature review. The MIS Quarterly article by Gefen, Karahanna and Straub (2003) was the most cited article, 442 articles had cited it up to August 2010. The 21st article in terms of the number of articles citing it was the MIS Quarterly article by Pavlou, Liang and Xue from 2007 with 42 citations. As the citations counts do not generally favour the most recent contributions, nine additional articles starting from Poddar et al. (2009) have been included in Table 16. These articles have been included since they either compare different theoretical frameworks (Lin, 2007), focus on a phase after the initial adoption has already taken place (Ahn et al., 2007; Hernandez et al., 2009a; Hsu et al., 2006), represent a contextually interesting area such as virtual communities (Lu et al., 2010), or shopping patterns for digital hedonic artefacts (Turel et al., 2010), or virtual stores (Barkhi et al., 2008), include more than one behavioural variable (Lu et al., 2010; Turel et al., 2010; Venkatesh & Agarwal, 2006), or examine the relationships between different behaviours (Lu et al., 2010; Venkatesh & Agarwal, 2006).

Table 16 Literature on online purchasing behaviour

Article	***Constructs and sample***	***Predictors of purchasing***
van der Heijden et al. (2003)	TAM + attitude + trust +risk (n=228 potential online shoppers)	Perceived risk is the main determinant of attitude towards online purchasing. Perceived ease of use and usefulness had no impact on attitude in the pure player online store.
Shim et al. (2001)	TPB (n=684 consumers with Internet access)	Intention to use Internet for information search is a strong antecedent of the online purchase intention
Gefen et al. (2003)	TAM + dimensions of trust (n=213 U.S. university students)	Perceived usefulness is the main predictor of e-commerce used (measured with willingness to use credit card and provides information for the online vendor), followed by trust and perceived ease of use.
Koufaris (2002)	TAM + Flow (n=280 U.S. online bookstore customers)	Double identity of the online consumer as a shopper and a computer user because both shopping enjoyment and the perceived usefulness of the site strongly predict intention to return.
Torkzadeh & Dhillon (2002)	n/a (scale development) (n=199 consumers with online shopping experience)	Internet shopping convenience, Internet ecology, Internet customer relations, and Internet product value are the fundamental means objectives for Internet commerce
Pavlou & Fygenson, (2006)	TPB extended with external beliefs related to getting information and purchasing from the online vendor (n=312 (main sample) consumers with online shopping experience)	Purchase intention acts as a predictor of intention to obtain information from the vendor. Getting information (actual behaviour), in turn, predicts purchase behaviour.
Shih (2004)	TRA+TAM extended with user satisfaction, perceived information quality, system quality and service quality as well as Web security and access costs as predictors of e-commerce	Individual attitudes toward e-shopping positively affect user acceptance. Consumer perceptions of the ease and effectiveness of e-shopping may influence attitude. Web security did not affect consumer willingness to shop

	acceptance (n=212 of Taiwanese employees)	online.
Limayem et al. (2000)	TPB + personal innovativeness (n=705 consumers)	Subjective norms, attitude, and beliefs have significant effects on the intention to buy online. PBC and intention significantly influence online shopping behaviour. Personal innovativeness has a positive effect on attitude and intention to shop online
Forsythe & Shi (2003)	Perceived risks and demographics (n=641 U.S. Internet users)	Perceived risk is likely to have a greater impact on the potential patronage behaviours of Internet browsers than on current shoppers.
Pavlou et al. (2007)	Integrative framework of different facets of uncertainty in online shopping context (n=198 (books) and 173 (prescription drugs) online consumers)	Negative impact of perceived uncertainty on purchase intentions, the impact of perceived uncertainty on purchase intentions was moderated by purchase involvement.
Poddar et al. (2009)	Website personality, Website quality and customer orientation (n=460 U.S. university students)	Website customer orientation and quality are predictors of the purchase intention.
Hernandez et al. (2009b)	Extended TAM (n=225 experienced e-shoppers)	Past online shopping behaviour is a predictor of future behaviour. The increase in efficiency, convenience or in the speed of purchase improves individuals' attitude towards the online channel. Motivations for e-purchasing are extrinsic and utilitarian. Self-efficacy fundamental for the development of e-purchasing.
Ahn et al. (2007)	Extended TAM, playfulness as a predictor of attitude and behavioural intent, information, system and service quality as the determinants of PU, PEOU and playfulness (n=942)	Playfulness has a significant impact on the behavioural intention to use and attitude toward use. PU was a stronger predictor of the intention to continue using the website.
Barkhi et al.	Applied TRA/TAM	Perceived usefulness, perceived

(2008)	(n=277 students)	behavioural control, and perceived peer influence impact on attitude towards purchasing from a virtual store. Attitude towards purchasing from a virtual store influences the actual purchasing
Hsu et al. (2006)	TPB + ECT (n=201 Taiwanese Internet users (mostly students))	Satisfaction is an important driver of users' continued shopping intention. However, attitude is the strongest predictor of the purchase intention.
Lin (2007)	Comparison of TAM, TPB and Decomposed TPB (n=297 Taiwanese online bookstore customers)	Decomposed TPB provides the best explanatory power.
Lu et al. (2010)	Trust in the website and other members of the community measured separately. (n=376 Chinese virtual community users)	Trust as a predictor of intention to get information and purchase intention. Causal relationship moves from the intention to get information to the purchase intention.
Turel et al. (2010)	Theory of consumption values (n=422 ringtone users)	Overall value of digital hedonic artefacts consists of appeal value, playfulness value and value for money. Social value was not found to be a significant component. Overall value is a predictor of use intention and word-of-mouth intention.
Venkatesh & Agarwal 2006)	Usability characteristics extended with individual characteristics and product type. (n=757 (phase 1) n=370 (phase 2) website users)	Perceived usability predictor of website use and purchase behaviour. A relationship from use to purchasing was established.

To summarise the reviewed literature, one can conclude that the theoretical frameworks predicting the acceptance of technologies have also been applied with regard to predicting online purchasing intentions. (Ha & Stoel, 2009; Hansen et al., 2004; Hernandez et al., 2009b) As a result, factors such as perceived ease of use, usefulness and enjoyment and satisfaction, among others, have been applied as determinants of online purchasing. (Ha & Stoel, 2009; Khalifa & Liu, 2007) The fact that e.g. TAM has been relatively widely applied in predicting online purchasing behaviour has been viewed as the acceptance of

web-based shopping platforms (see e.g. Vijayasarathy, 2004). In addition to TAM, TPB has also been rather extensively used as a theoretical foundation in the reviewed literature.

In the reviewed literature, both perceived usefulness and ease of use have been found to be relevant predictors of online purchasing behaviour (Gefen et al., 2003; Hassanein & Head, 2007; Hernandez et al., 2009b; Pavlou & Fygenson, 2006). In addition to the core constructs of TAM, the effect of web site quality has been discussed in the literature (Ahn et al., 2007; Chang & Chen, 2008; Poddar et al., 2009). Additionally, several studies have identified the role of social presence in predicting online shopping and e-commerce acceptance (Cyr et al., 2007; Dash & Saji, 2007; Gefen & Straub, 2004; Hassanein & Head, 2006; Hassanein & Head, 2007).

Similarly to offline purchasing behaviour, online purchasing has been found to be influenced by both hedonic and utilitarian motives. Chiu & Chang et al. (2009) found perceived enjoyment and perceived usefulness to be virtually equally powerful predictors of the online repurchase intention. In their study on e-shopping acceptance Ha & Stoel (2009) used the online shopping intention as their dependent variable and found that both perceived usefulness and ease of use predict the e-shopping intention. Shang et al. (2005) used the cognitive absorption construct and found it to be a significant predictor of perceived ease of use and usefulness but that it does not have a direct influence on online shopping behaviour. Childers et al. (2001) argued that interactive media are becoming more immersive and that the role of hedonic motivation is becoming at least as equally important as the utilitarian one.

Prior research offers somewhat mixed evidence regarding the role of social influence. Vijaysarathy (2004) found online shopping intention being influenced by normative beliefs. Hsu et al. (2006) examined subjective norms with two constructs namely interpersonal influence and external influence. Interpersonal influence was found to be a significant antecedent of the intention to continue online shopping, whereas external influence was found to have an insignificant effect. In their examination of e-commerce adoption Pavlou and Fygenson (2006) did not find that subjective norms predicted either the intention to seek information online or the online purchase intention.

The literature has also examined factors that facilitate online purchasing behaviour. Perceived behavioural control was found to be a significant factor in e-commerce adoption as it predicted the intention to obtain information about products as well as the purchase intention and their respective behaviours (Lin, 2007; Pavlou & Fygenson, 2006). PBC was also found to be a predictor of continuous online shopping behaviour (Hsu et al., 2006). Moreover, self-efficacy has been verified as a predictor of online shopping intention (Vijayasarathy, 2004) and as a predictor of perceived behavioural control (Lin, 2007).

Trust has been claimed to be one of the most widely investigated single factors influencing online consumer behaviour (Kim et al., 2005). An extensive stream of literature has evolved around trust in the online context covering various aspects of e-commerce (Kim et al., 2005; McKnight et al., 2002). A number of studies have examined the role of trust in online purchase behaviour. (Cheung, 2005; Gefen et al., 2003; Pavlou & Fygenson, 2006; Sia et al., 2009) It has also been found to influence the acceptance of e-commerce (Pavlou, 2003) as well as subsequent behaviour (Kim et al., 2009). In addition, trust has been examined in relation to perceived risk (Pavlou, 2003), uncertainty (Pavlou et al., 2007) and social presence (Gefen & Straub, 2004) as well other factors.

Taken together, the literature on online purchasing and shopping behaviour is rather extensive. Importantly, the literature also offers certain contextual points of reference such as virtual communities, online games and social media (Hsu & Lu, 2007; Lu et al., 2010). The importance of customer loyalty has also been addressed in online purchasing and shopping literature (Chao-Min Chiu et al., 2009; Gefen, 2002; Hsu et al., 2006; Reichheld, 2000), additionally issues related to online repurchase behaviour, consumer retention and e-loyalty have attracted attention (Anderson & Srinivasan, 2003; Cyr et al., 2007; Hernandez et al., 2009a; Khalifa & Liu, 2007; Shankar et al., 2003). Altogether, the fact that this issue has been rather widely addressed in the reviewed literature provides support for the viability of focusing on the two post-adoption behaviours.

4.3 Purchasing behaviour in virtual worlds

From a strict technical perspective, virtual products are similar to digital ones such as mp3s, both consist of ones and zeros. Despite the fact that the users are represented in the form of avatars inside the virtual worlds, the consumer purchasing virtual items or services from the VW operator is a real individual in a juridical sense, just as the SVW operator is a legal entity. Thus, in this respect, virtual purchasing does not differ from “traditional” B2C e-commerce. What makes virtual products, assets and services distinct from the digital ones is that they can be used only inside a specific virtual environment (Lehdonvirta, 2009b). As a result, the sustainability of the virtual world is a prerequisite for the purchased items having value. Taken together, the main difference between online purchasing and virtual purchasing relates to the environment in which the consumption takes place. Furthermore, compared to, for instance, purchasing an mp3 product, virtual items and services are usually purchased with in-world currency and the consumer uses real money to purchase the in-world currency.

Virtual item purchase behaviour and its reasons have been examined by Guo & Barnes (2009). In order to purchase virtual items, users must first find them

worth pursuing. In relation to why a virtual item is purchased, reasons such as social influence, effort and performance expectancy, the quality of the VW and resources related to a user's real life circumstances as well as to the virtual items themselves were mentioned. The studies by Nojima (2007) and Oh and Ryu (2007) have focused on virtual item purchasing and selling. Nojima (2007) found that players who buy items have a perceived higher level of immersion in in a game. Oh and Ryu (2007) focused on the balance between virtual items that had been earned while playing the game and the ones bought. Furthermore, Lehdonvirta (2009) conceptually identified three classes of virtual item purchase drivers functional (game performance – advanced characters), hedonic (aesthetic appeal) and social (visual appearance, rare collectibles) (Lehdonvirta, 2009a).

Shin (2008) has investigated purchase behaviour in virtual environments involving an in-world currency. Subjective norms and perceived risk were found to have the strongest influence on the transaction intention, followed by perceived ease of use and perceived usefulness. Trust was found to be an antecedent of both PU and PEOU. The findings of Shin indicate that trust and subjective norms exert important influences on purchasing behaviour in virtual worlds.

Cha (2009) has examined the attitudinal differences between purchasing virtual and 'real' items within social networking sites. Interestingly, of PU, PEOU and enjoyment only PEOU was found to have a significant effect on attitude. The perceived fit between the items sold and the social networking sites was found to be the strongest predictor of attitude.

Shelton (2010) explored the relationship between usage and purchasing motivations in Second Life and compared them to real-life purchasing habits. Shelton categorised the respondents into identity-motivated, social/entertainment-motivated and achievement-motivated users. A key finding was that the usage motivation reflects virtual purchasing behaviour.

To conclude the chapter, online purchasing behaviour has been rather extensively examined, whereas the prior literature on purchasing behaviour in virtual worlds from an individual user's perspective is sparse. The review of online purchasing behaviour research indicated a variety of factors that potentially influence in the VW setting.

However, a perhaps more interesting finding from the chapter relates to the nature of virtual purchasing behaviour in relation to traditional online shopping. An important characteristic of virtual purchasing is that rather than being a goal in itself, it offers a user the means to obtain something inside the virtual world or make the user experience better.

This chapter has aimed at giving an overview of the research on online purchasing behaviour and the current state of literature on purchasing behaviour in virtual worlds. Together, Chapters 3 and 4 form an overall understanding of

the research area and the two key behaviours of this study, and the relationship between them. Based on this understanding, the following chapter discusses the characteristics of the use context of the SVW examined here and goes deeper into the selected theoretical perspectives in order to develop the research model.

5 RESEARCH MODEL AND HYPOTHESES

This chapter presents the research model and draws the hypotheses. The chapter begins by explaining the characteristics of the SVW use context in order to identify factors salient for predicting the continuous use of Habbo and purchasing behaviour in Habbo and to understand their mutual relationship. Thereafter, alternative theoretical foundations are discussed. In the second subchapter the theoretical origins of the research model are presented in order to build the nomological net of the research. The third and final subchapter presents the hypotheses regarding continuous SVW usage and purchasing behaviour in relation to SVWs.

5.1 Understanding the characteristics of SVW use

As argued by Benbasat and Zmud (2003) as well as Agrawal and Prasad (1997) the usage context of the IT artefact in an important issue to be taken into consideration when investigating usage behaviour. This is particularly important in the present study where the IT artefact in question, use context and the user group differ considerably from the context in which most of the seminal studies on technology adoption have been conducted.

First of all, social virtual worlds can be used for various purposes (Brown, 2008; Jung & Kang, 2010). For most users, SVW are used primarily for other reasons than fulfilling solely utilitarian needs. For instance, SVW use can produce user utility by offering new methods of communication and social interaction. In this regard SVWs belong to an increasing group of applications used for both utilitarian and hedonic purposes, which are labelled multipurpose information appliances (Hong & Tam, 2006).

Entertainment is a central element in SVWs. For example, Habbo includes various non-violent games the users can play. In addition, various events are organised by the operator but also by the users themselves. Bands, artists and celebrities are invited to visit Habbo on a regular basis. In contrast to Second Life, Habbo credits cannot be exchanged back into real money. Thus, in sum, the use context of Habbo underscores the importance of hedonic motivations. As a result, motivational factors are likely to influence continuous use.

Furthermore, an important feature of an SVW is social interaction with other users. The user can be in touch with friends offline or meet new people in the

virtual environment. SVWs include various features for promoting social interaction among users such as chatting, public spaces to meet other people and a virtual space for each user into which one can invite other users. As a result, the decision on the use of a certain SVW is not likely to be made in a vacuum but will be influenced by other people. In addition, building virtual identify and signalling status are claimed to be reasons for purchasing virtual items. Without other people becoming involved in the SVW, its use and subsequent purchasing behaviour would make little sense. In contrast to e.g. workplace IT, the use of SVWs is entirely voluntary. Moreover, actual use takes places in homes, in other words, the other users are not physically present for one another. Additionally, the users are anonymous and revealing one's real-life identity is not allowed. Taken together, it can be assumed that social factors determine continuous SVW use and purchasing behaviour, but also that the root causes of the role of social influence may differ from those in a setting where the users know each other and are physically located close to one another.

The actual use of SVWs differs from other information systems, such as website navigation, since the user interface includes components traditionally characteristic of games. The use of avatars and 3D graphics for the core of the navigational mechanism is interesting from the usability perspective since avatars have been found to reinforce social presence in online environments (Bente et al., 2008). Furthermore, social presence has been found to have a positive effect on the intentions to shop online (Gefen & Straub, 2004). As the avatars in Habbo are animated characters that do not resemble human beings, social presence is an interesting construct to be examined. As a result, factors related to the user interface are assumed to be meaningful in predicting continuous SVW engagement as well as purchasing behaviour.

An interesting characteristic of Habbo to be taken into consideration is that its target user group is teens. This means that, to a certain extent, their use of the computer and Internet may be influenced, monitored and perhaps limited by parents. On the other hand, the users have been exposed to information technology since their childhood and they can be assumed to be rather confident with using various types of IT applications. Thus they can be referred to by the term 'digital natives' (Palfrey & Gasser, 2008). Thus, the role of facilitating factors is examined. The research model with supporting theories is further elaborated on in the following subchapter.

Finally, the purchasing behaviour in Habbo differs from that of the traditional online shopping scenario in which the purpose of the site visit primarily relates to shopping. Habbo has not been designed to be a shopping platform but offers a recreational environment for young people who then have the option to purchase premium memberships and virtual items. Furthermore, since the goods and services purchased can only be used and have value inside the virtual world,

purchasing behaviour in Habbo is likely to result from usage rather than being the goal per se.

5.2 The nomological net

The present research focuses on understanding the determinant of two behaviours, continuous SVW use and purchase behaviour. Respectively, continuous use intention and purchase intention are positioned as the dependent variables.

An extensive body of empirical evidence has verified a sufficiently strong causal link between intention and behaviour (Sheppard et al., 1988). For example TAM and TPB assert that IT usage is determined by *IT usage intention,* due to the human tendency to behave in accordance with intentions. Intentions, in turn, are predicted by cognitive beliefs or perceptions of IT usage. Using the behavioural intention as a dependent variable has been explicitly supported e.g. by Mathieson (1991) and Li et al. (2010). From a managerial viewpoint the use of the established intention–behaviour approach enables the examination of users' continuous engagement in SVWs at a time when the use of virtual worlds as well as virtual consumption is rapidly increasing.

Behavioural intention has been shown to predict the performing of a conscious act by an individual, such as deciding to adopt (or use) a technology (Venkatesh & Davis, 2000; Venkatesh et al., 2003). The investigative locus is hence on identifying essential determinants of intention that are salient in the SVW setting.

In the present study, purchase intention is placed as the second dependent variable. Since virtual environments for social interaction are a relatively recent phenomenon, only a limited number of prior studies have so far investigated purchasing behaviour in this setting. Prior research has examined purchasing behaviour in virtual environments with e.g. TAM (Shin, 2008). Lu et al. (2010) developed a trust-based model to investigate purchasing behaviour in virtual consumer-to-consumer (C2C) communities. Furthermore, Ofir et al (2010) examined the different dimensions of perceived value as a predictor of the acceptance of digital hedonic artefacts.

The assumption here is that the purchase behaviour is to a certain extent determined by the fact that the same factors also predict continuous engagement. However, in this respect it should be highlighted that purchasing behaviour is also likely to be influenced by factors that are distinct from continuous use. Usage temporally precedes purchasing, suggesting that continuous use is a predictor of purchase intention.

Prior research on the user adoption of virtual worlds has applied the technology acceptance model as its theoretical foundation (Fetscherin & Lattemann, 2008; Hua & Haughton, 2009; Shen & Eder, 2009a; Shen & Eder, 2009b; Shin, 2008). TAM has been complemented with e.g. components of flow (Hua & Haughton, 2009) and perceived enjoyment (Shen & Eder, 2009a). As a result, research on the adoption of virtual worlds can be included in the abundant literature applying TAM in a number of different settings (Gefen et al., 2003; Pavlou, 2003; Premkumar & Bhattacherjee, 2008; van der Heijden, 2004; Venkatesh & Davis, 2000).

The literature includes several important contributions made by adding new variables to the core constructs of TAM (see e.g. Gefen et al., 2003; van der Heijden, 2004; Vijayasarathy, 2004). But, this has also raised concerns as to whether the rather heavy reliance on TAM, as well as its constant extensions, is actually the best strategy for technology acceptance research (Benbasat & Barki, 2007).

Nevertheless, the predictive validity of PU and PEOU has been verified in various settings (see e.g. Gefen et al., 2003; Venkatesh et al., 2003). However, they cannot cover all the unique characteristics and different use contexts of IT applications. As a result, for the needs of this study, TAM would need to be complemented with additional variables to better grasp the SVW use context. This, using the expression of Benbasat and Barki (2007), "patching-up" of TAM, would likely lead to the need to make another contribution to the "theoretical chaos and confusion" caused by adding new variables to complement PU and PEOU (Benbasat & Barki, 2007, 211-212). The outcome, an extended and applied TAM-based model, would inevitably be quite far from the model developed by Davis (1989) both in terms of context as well as the variables used in the model. Because of these issues, the applicability of other theoretical frameworks is scrutinized here.

Decomposed TPB has been suggested as a theoretical tool that would be applicable for examining continuous SVW use (Merikivi & Mäntymäki, 2009; Mäntymäki & Merikivi, 2010b; Mäntymäki et al., forthcoming). The advantage of TPB is its ability to incorporate the effect of attitudes, subjective norms and perceived behavioural control. Furthermore, decomposing belief structures according to Taylor & Todd (1995a) enables taking the use context and the characteristics of the IT artefact into account. However, in practice, the challenge with TPB as well as TRA is that they postulate that attitude towards behaviour fully mediates the effect of behavioural beliefs on intention. The effect of attitude has been found to be somewhat inconsistent (see e.g. Davis et al., 1989; Venkatesh et al., 2003), suggesting a direct link between beliefs and intention.

The IS continuance model specifically focuses on predicting continuous IT use by building on expectation-(dis)confirmation theory and TAM (Bhattacherjee,

2001b; Thong et al., 2006). However, the IS continuance model and its extensions do not take into account social influence or facilitating conditions. Innovation diffusion theory concentrates on the characteristics intrinsic to technology (or innovation) whilst the intention based-models such as TRA, TAM and TPB anchor the analysis with regard to how the important characteristics of a technology are communicated and perceived by target users. In the present study, the focus is on the users' perceptions rather than the IT artefact itself. In sum, the aforementioned theoretical frameworks also seem to require several extensions and adaptations in order to meet the characteristics of the SVW setting.

Hence, rather than taking this approach, the present study adopts the approach by Venkatesh et al. (2003) and strives to develop an integrative framework. UTAUT was developed as a synthesis of the eight models that examine technology adoption. It takes into account the expected performance of the IT artefact, the expected effort required to use the system as well as social influence and facilitating conditions. This study also follows the approach by Venkatesh et al. by developing a new framework for explaining continuous SVW use and purchasing behaviour and applies UTAUT as a loose nomological core for the development of a research model, grasping the characteristics of SVW use rather an exact theoretical framework to be tested as such.

UTAUT examines age, gender, voluntariness of use and experience as moderating factors. As this research investigated only single IT artefacts targeted at a specific demographic group, the moderating effects are not explicitly hypothesised, but are empirically tested.

As argued earlier, in order to grasp the use context and characteristics of SVWs the research model on the use of SVWs is viewed as being determined by motivational, social, interface-related, and facilitating factors. Respectively, the model is based on several theoretical constituents; motivation theories are used as the theoretical foundation for the motivation block in the research model. Each block consists of two variables reflecting different sources of the influence covered by the block. The theoretical origins for developing the hypotheses regarding the role of the social factors are the theory of reasoned action as well as the theory of network externalities and innovation diffusion theory. TAM and social presence theory are used as the grounding for the interface-block. Finally, the facilitating factors originate from social cognitive theory and TPB. All the selected theoretical perspectives have been used in prior technology adoption research and are not metatheoretically contradictory. Table 17 summarises the constructs of the research model and presents their definition and the theories they originate from.

Table 17 Constructs of the nomological net of the research

Driver of SVW use	***Variable***	***Definition***	***Theoretical origin***	***References***
Motivational factors	Perceived enjoyment	The extent to which using the SVW is perceived as enjoyable in its own right.	Motivation theories, Self-determination theory	Deci (1975); Deci & Ryan (1980); Deci & Ryan (2000)
	Perceived usefulness	The degree an individual believes using the SVW will help him or her to attain gains in social interaction and free time	Motivation theories, Self-determination theory	Deci & Ryan (1980); Thompson et al. (1991)
Social factors	Perceived network size	The perception of the degree to which important others are present in the SVW.	Theory of network externalities, IDT	Katz & Shapiro (1985); Rogers (2003); Shapiro & Varian (1999); Valente (1995)
	Subjective norm	The normative influence from the important referents.	TRA, TPB	Ajzen (1991); Ajzen (2005); Fishbein (1967)
Interface factors	Perceived ease of use	The degree to which an individual perceives using an SVW is free of effort	TAM	Davis (1989); Moore & Benbasat (1991); Venkatesh et al. (2003)
	Perceived social presence	The degree of human warmth associated with the SVW.	Social presence theory	Short et al. (1976); Yoo & Alavi (2001)
Facilitating factors	Self-efficacy	Judgment of one's capability to use the SVW	Social cognitive theory	Bandura (1977); Bandura (1986); Compeau & Higgins (1995)
	Availability	External factors preventing the use of the SVW	TPB	Hsieh et al. (2008); Venkatesh et al. (2003)

As the focus of the research is on predicting the dependent variables, rather the relationships between different factors and variables, the factors are hypothesised. However, it is noted that the constructs used in the research model are likely to be related. The nomological net of the research model is presented in Figure 15.

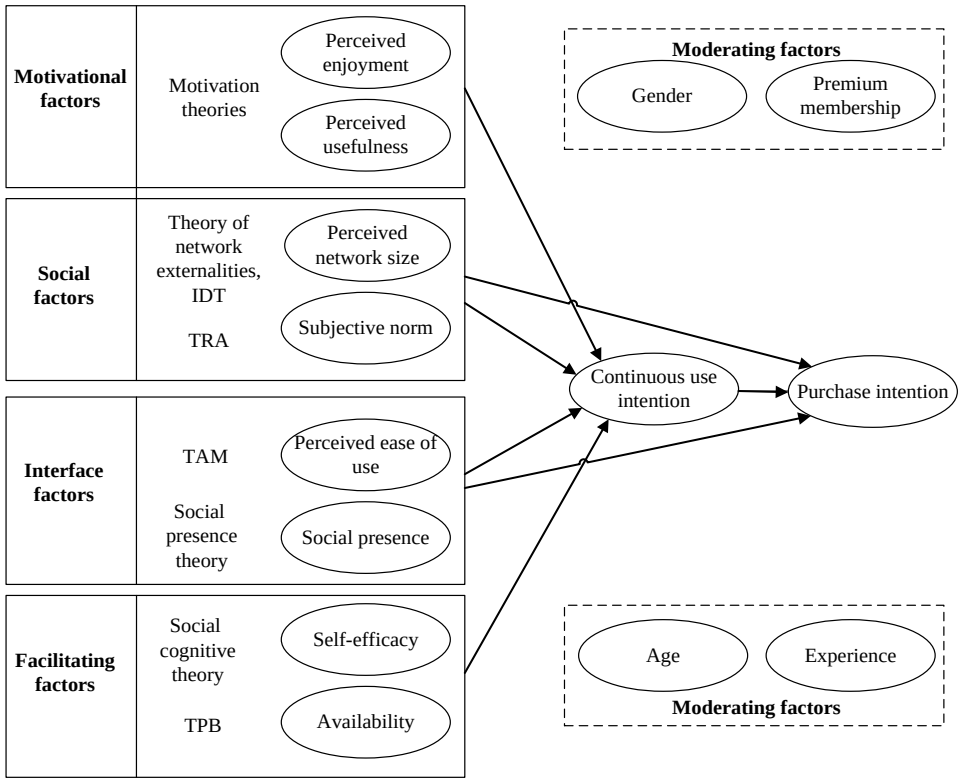

Figure 15 The nomological net of the research

Gender, age and length of experience are viewed as potentially moderating the influence of the effects of the motivational, social, interface and facilitating factors. However, their influence is not formally hypothesised. In the following subsection, the research hypotheses are drawn.

5.3 Hypotheses

5.3.1 Predictors of the continuous use intention

Motivation theorists have usually distinguished between two types of motivation for performing a certain behaviour, namely an extrinsic or an intrinsic motivation. (Calder & Staw, 1975; Deci, 1975; Deci & Ryan, 1980; Scott et al., 1988). Extrinsic motivation refers to the performing of a given behaviour due to the desirable outcomes that are distinct i.e. extrinsic from the behaviour itself. These outcomes can also be referred to as rewards (Lawler & Porter, 1967). Lawler & Porter (1967, 126) refer to Maslow (1954) and Porter (1961) when claiming that rewards are valued to the extent that an individual believes they will provide satisfaction of his/her needs for security, social esteem, autonomy and self-actualisation. In the literature, e.g. increased job performance, promotion or money are often used as examples of desirable outcomes extrinsic from the behaviour (Davis et al., 1992; Lawler & Porter, 1967).

In technology adoption and acceptance research the extrinsic-intrinsic dichotomy has been measured with perceived usefulness which reflects the extrinsic motivation and utilitarian aspects of IT use and the perceived enjoyment covering the intrinsic motivation (Davis et al., 1992; van der Heijden, 2004). Davis et al. (1992, 1113) defined 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."

Prior research has found perceived enjoyment an important driver of information technology use (Davis et al., 1992; Hong & Tam, 2006; Igbaria et al., 1995; Moon & Kim, 2001; Teo et al., 1999; van der Heijden, 2004; Venkatesh, 2000). Since SVWs are used for entertainment and leisure, it is likely that that intrinsic motivation plays a role in predicting continuous use.

Moreover, there is also empirical evidence on the importance of intrinsic motivation in predicting the use of social virtual worlds (Mäntymäki, 2009; Shin, 2009), online games (Fang et al., 2009; Lin & Bhattacherjee, 2010), online communities (Hsu & Lu, 2007) and social networking sites (Sledgianowski & Kulviwat, 2009). As a result, it is hypothesised:

H1: Perceived enjoyment positively affects the continuous use intention.

The role of extrinsic motivation – most often measured with perceived usefulness – in predicting technology adoption has been extensively validated in prior literature (Davis, 1989; Legris et al., 2003; Venkatesh & Davis, 2000; Venkatesh et al., 2003; Venkatesh et al., 2007).

As the body of research focusing on individual-level technology adoption has traditionally focused on organisational computing and workplace IT, the conceptualisations of the extrinsic motivation e.g. perceived usefulness or outcome expectations has focused on the role of IT in improving job performance. Yet VWs are used for e.g. business, education and other utilitarian purposes, SVWs for teens and children rarely accommodate features such as a tradable currency. Hence, the potential utility from their usage is likely to be related to other areas such as socialising and interaction with other people.

Extrinsic motivation has also been found to predict the adoption of online games, social networking sites (Sledgianowski & Kulviwat, 2009), instant messaging (Li et al., 2005) In the VW context, extrinsic motivation, i.e. perceived usefulness has been found to predict user adoption both directly (Fetscherin & Lattemann, 2008) and indirectly via attitude (Hua & Haughton, 2009; Shin, 2009). Therefore, it is plausible to put forward the hypothesis:

H2: Perceived usefulness positively affects the continuous use intention.

The basic tenet of the theory of network externalities is that the behaviour of an individual, e.g. using a product or service, may have an effect on the value other people receive from using the same product or service (Katz & Shapiro, 1985; Katz & Shapiro, 1986; Shapiro & Varian, 1999). As an example of positive network externalities, the theory posits that the value of a network increases when the number of people participating in the network increases (see e.g. Katz & Shapiro, 1985). According to Metcalfe's law, the value of a telecommunications network is proportional to the square of the number of connected users of the system (Shapiro & Varian, 1999).

The diffusion of innovations theory postulates that there is a point in the adoption curve – when a sufficient number of people have adopted an innovation – at which the adoption becomes self-sustaining. This is referred to as critical mass (Rogers, 2003). For an individual user, evaluating the actual size of the network, or whether an innovation has reached a critical mass, is often problematic. Thus, the decisions are more likely grounded on individual's perceptions (Lou et al., 2000).

Using an SVW would be meaningless if there were no other people with whom to interact. Hence, it is generally important to maintain a large number of users to keep the social interaction in the SVW vibrant. However, from the user perspective, the psychological proximity of the users is likely to play a role; a high degree of users in one's personal network is likely to be a stronger driver of continuous use rather than the number of other people in general. In the context of this study, evaluating the number of relevant people involved in the SVW may

possess additional challenges because of the anonymity of the users inside the virtual world.

In prior research these perceptions have been examined with e.g. perceived critical mass (Li et al., 2010; Li et al., 2005; Lou et al., 2000; Van Slyke, 2007), perceived network exposure (Valente, 1995) and perceived network size (Lin & Bhattacherjee, 2008) as predictors of technology use. Additionally, the presence of other users have been found to predict an individual's intention to use instant messaging (Li et al., 2010; Li et al., 2005) and social networking sites (Sledgianowski & Kulviwat, 2009), both of which have similar characteristics to SVWs. Thus, it is hypothesised:

H3: Perceived network size positively affects the continuous use intention.

According to TRA and TPB, subjective norms predict the behavioural intention (Ajzen, 1991; Fishbein & Ajzen, 1975). Subjective norms are conceptualised as perceived social pressure from relevant others to either perform or not to perform the behaviour in question (Gefen & Straub, 2004). The reasoning behind the direct effect of subjective norms on behavioural intention lies in the fact that people may choose to perform a behaviour, even though they are not personally favourable towards the behaviour or its consequences (Venkatesh & Davis, 2000, 187). In contrast to perceived network size that encompasses the network effect, the subjective norm construct represents the normative side of social influence. In the SVW use setting, subjective norms are most likely to influence via internalisation, identification and compliance mechanisms (Kelman, 1958; Kelman, 1961). Internalisation occurs when an individual perceives that an important referent thinks the individual should perform a certain behaviour, and thus they incorporate the referent's belief into their own belief structure. Identification refers to a process where important referents in one's social environment believe that one should perform a behaviour, and that performing it can enhance one's status in the group. Compliance occurs when one conforms to the expectations of another in order to receive a reward or to avoid rejection and hostility. In the SVW context, a punishment for not using the SVW can be that an individual is left outside the social interaction that happens inside the virtual environment. Thus, although somewhat different to a direct punishment from e.g. a superior, the potential influence compliance mechanism should not be neglected.

The effect of subjective norms on intention has been found to be somewhat inconsistent (Hsieh et al., 2008; Venkatesh & Bala, 2008; Venkatesh & Davis, 2000). Empirical studies have rather consistently found the influence of subjective norms to be less significant in the continuous phase of technology diffusion, or where the use of the technology is voluntary (Kraut et al., 1998;

Venkatesh et al., 2003) Instead, the impact of social influence has been found significant in the early phase of mandatory use (Venkatesh & Davis, 2000).

However, subjective norms have been found to predict user behaviour in e.g. online games (Hsu & Lu, 2004), blogs (Hsu & Lin, 2008) and virtual communities (Chiu et al., 2006). Recent literature has also found subjective norms to be a significant factor in the user adoption of virtual worlds (Hua & Haughton, 2009).

Furthermore, as regards the SVW investigated here, the users are anonymous inside the virtual environment. This is likely to make identifying the important referents – the sources of normative influence –, different from contexts where the other users are known and perhaps also present in the physical environment. As a result, in order to examine the role of subjective norms, the hypothesis is postulated:

H4: Subjective norms positively affect the continuous use intention.

Perceived ease of use has been verified to be an important predictor of IT acceptance in a number of studies (see e.g. Lee et al., 2003; Legris et al., 2003; Venkatesh, 2000). Also studies emanating from other origins than TAM have employed similar constructs but labelled them differently such as ease of use (Moore & Benbasat, 1991) and complexity (Thompson et al., 1991).

Thereafter, the influence of PEOU has also been found to be somewhat inconsistent, particularly during the latter stages of usage. (Premkumar & Bhattacherjee, 2008; Venkatesh & Bala, 2008; Venkatesh et al., 2003). Longitudinal studies have suggested that the decreasing effect of PEOU indicates the "wearing out" of users' original inhibitions regarding PEOU as they become more experienced and comfortable in using the new system (Szajna, 1996). The wearing out effect is likely to be relevant with workplace IT, where the IT artefact is generally used for a predefined purpose and routinisation is important for materialising the business benefits.

In their study on the acceptance of virtual worlds Fetscherin & Lattermann (2008) found PEOU to be being a significant, yet relatively weak predictor of use intention. Hua & Haugton (2009) found PEOU to be a determinant of attitude but did not examine the direct effect. Similarly PEOU was found to predict attitude in the online gaming setting (Hsu & Lu, 2004). Sledgianowski and Kulviwat (2009) found PEOU to be a more powerful predictor of the intention to use social networking sites than PU.

In the present study, the inclusion of the PEOU construct can also be grounded with contextual arguments. First of all, the user decides for what purpose and how he or she uses the SVW and can also stop using it. The operators frequently introduce new features and create new events to sustain user attraction. Thus,

being difficult to use would likely lead the users to abandon the SVW or switch to another one. Second, the flow of new features and activities requires a user's attention; it is thus important that the basic user interface is ease to operate and that exploring the environment is easy. Third, SVWs contain avatars that are used to navigate in the 3D environment. The avatar-based user interface differs considerably from traditional website navigation and thus it is plausible that perceived ease of use contributes to continuous engagement in the SVW. Based on the theoretical and contextual arguments, the respective hypothesis is postulated as follows:

H5: Perceived ease of use positively affects the continuous use intention.

Information (or media) richness distinguishes between communication media based on their ability to facilitate understanding, i.e. reproduce the information sent over the medium. Media can be categorised as high or low in 'richness' based on their capability to facilitate shared meaning (Daft et al., 1987, 358). Face-to-face communication is the richest medium whereas formal, unaddressed documents, such as fliers or computer reports, are considered low in richness. Another central tenet of information richness theory is that that highly equivocal tasks generally call for rich media that allow or even encourage a high degree of personal interaction. (Daft & Lengel, 1986; Straub & Karahanna, 1998.)

In a similar vein, social presence theory posits that communicators assess the degree of social presence (SP) required by the task and fit it to the social presence of the medium (Short et al., 1976). Social presence can be defined as the extent to which a medium allows users to experience others as being psychologically present (Fulk et al., 1987; Short et al., 1976). According to Short et al. (1976), social presence theory views social presence as a quality inherent in a communication medium. The social presence of a medium has also been characterised in relation to the media's ability to transmit e.g. non-verbal cues (Short et al., 1976).

Social presence has also been considered to be related to information richness theory (Daft & Lengel, 1986; Straub & Karahanna, 1998). From a psychological standpoint, social presence can be characterised as the "warmth" of the media, i.e. its ability to transmit the feeling of human warmth and sensitivity (see Yoo & Alavi, 2001). In the online context, social presence has been characterised as the website's capacity to convey a feeling of human warmth and sociability (see Cyr et al., 2007).

Social presence has been found to increase trust via its impact on increased electronic communication (Gefen, 1997). Furthermore, Karahanna and Straub (1999) found social presence to be an antecedent of perceived usefulness. Social presence has been found to have a positive impact on e.g. customers online

purchase intentions and e-loyalty (Cyr et al., 2007; Gefen & Straub, 2003). Moreover, social presence reinforces customers' trust in the online shopping setting (Gefen & Straub, 2004). Photographs and personal greetings, among others, have been found to increase websites' social presence (Hassanein & Head, 2006). Prior research on the role of social presence in users' engagement in SVWs or virtual worlds is scarce. However, social presence has been found to directly reinforce loyalty in the e-service context (Cyr et al., 2007) and have a positive impact on the adoption of e-mail (Gefen, 1997).

SVWs are also used for social interaction and communication. Additionally, SVW users do not generally know each other in the offline world which makes establishing social cues and a feeling of human warmth within the service perhaps even more meaningful. A friendly and warm atmosphere is likely to encourage social interaction between users and thus increase a user's willingness to continue using the service.

Habbo's interface includes animated avatars that more closely resemble cartoon figures or Lego characters than human beings. Violent conduct is not possible and insulting other users may lead to e.g. temporary or permanent suspensions of an individual's account. The Habbo interface provides a number of tools with which to enrich communication compared to e.g. traditional instant messaging. For example, the user can customise his or her avatar as and virtual room, choose gestures and features corresponding to their current mood and make e.g. dance moves. All these features can be viewed as increasing Habbo's richness as a communication medium and constitute its unique value-added quality for users. Hence, the hypothesis put forward is:

H6: Perceived social presence positively affects the continuous use intention.

Social cognitive theory (SCT) posits a triadic reciprocity between the behaviour an individual intends to perform, his/her cognitive perceptions, and the environment. SCT asserts that people tend to perform behaviours which they believe will lead to favourable consequences rather than ones resulting in negative ones. Furthermore, the beliefs about one's ability to perform a specific behaviour, referred to as self-efficacy, influence the choices about which behaviours to perform (Bandura, 1977; Bandura, 1982; Bandura, 1986).

Self-efficacy has been defined as people's judgments of their capability to organise and to perform courses of action required to attain designated types of performances. It is not concerned with the skills one has, but with the judgments of what one can do with whatever skills one possesses (Bandura, 1986, 391).

Compeau & Higgins (1995) developed a measurement scale for examining computer self-efficacy in determining IT adoption. In addition, the literature has also made a similar distinction and examined the relationship between general

and specific computer self-efficacy (Agarwal et al., 2000). General self-efficacy refers to self-efficacy with computers whereas specific self-efficacy is related to a specific software or application., A number of studies have examined the role of SE in various technology adoption settings (Hernandez et al., 2009a; Hsu et al., 2007; Vijayasarathy, 2004), including SVWs (Shin, 2009). In this research, the focus in on self-efficacy with a specific SVW (Agarwal et al., 2000; cf. Yi & Hwang, 2003) rather than general computer self-efficacy.

With regard to Habbo, self-efficacy is a meaningful construct to be examined since the user using the SVW must feel confident not only with the avatar-based navigation but also with the social dynamics and the code of conduct inside the virtual world. Second, young users have become familiar with ICT and the Internet from early childhood and can be described as digital natives. This makes learning to use IT applications faster and more intuitive compared to older generations. In summary, the influence of self-efficacy is a useful topic with which to examine the continuous use intention from the perspective of the characteristics of the IT artefact, but also from the perspective of the characteristics of the user group. As a result, it is hypothesised:

H7: SVW-specific self-efficacy positively affects the continuous use intention.

In TPB, perceived behavioural control is determined by a set of beliefs that deals with the presence or absence of requisite resources and opportunities for performing the behaviour (Ajzen, 1991). Ajzen refers to self-efficacy as internal resources and to Triandis' concept of facilitating conditions (cf. Triandis, 1989) for the external resources.

In technology adoption research, facilitating conditions have been defined e.g. as the degree to which an individual believes that an organisational and technical infrastructure exist to support the use of the system (Venkatesh et al., 2003, 453). In the SVW setting, the organisational and technical infrastructure are not particularly salient factors for facilitating usage since their use is not associated with working at a specific organisation and is thus not mandated by the organisation. However, the availability of the technology can act inhibit user adoption. Availability may be limited e.g. because of the costs associated with using the technology or because of the challenges in accessing the technology (Hsieh et al., 2008; Taylor & Todd, 1995b).

The direct costs associated with using Habbo are not likely to be influential prohibiting factors that would prevent adoption or continuous use since access is free of charge. However, using SVW requires access to a computer and the Internet. Since the users of the SVW are teenagers who normally live with their parents and siblings, it can thus be assumed that the parental control may reduce the time spent in front of the computer and that access to the computer needs to

be negotiated with the other members of the household (see Merikivi & Mäntymäki, 2009). In consequence, it is plausible to assume that the availability of the SVW is not automatically unlimited and that challenges in availability have a negative influence on the continuous use intention. Thus, the respective hypothesis put forward is:

H8: Availability negatively affects the continuous use intention.

5.3.2 Predictors of the purchase intention

Continuous use and purchasing, although conceptually distinct can be viewed as reflecting an individual's commitment to the SVW, the former measures the investment in terms of time and effort and the latter in money. As a result, continuous use and purchasing are likely to have common but also separate determinants. In this research only part of the hypothesised determinants of the continuous use intention are assumed to influence directly the purchase intention. The final set of hypotheses deals with predictors of the purchase intention.

In the e-commerce context, a central goal is to make the website as "sticky" as possible so that it often attracts users and retains them for longer periods of time. The business logic of B2C e-commerce lies within the value proposition that the online channel can aid firms in transcending physical barriers to reaching customers and increase the size of their customer base. However, the value proposition transfers into revenue only if the customers use the electronic channel to place purchases (Schlosser, 2006; Venkatesh & Agarwal, 2006).

Transforming visitors into paying customers is a focal challenge for many businesses in the field of social media and online social networking. In the SVW business, Habbo constantly attempts to encourage purchasing behaviour inside the virtual world and applies several means, for example, rewarding users with special credits for long-term participation in order to boost the in-world economy.

As regards the development of the customer relationship in the SVW context, continuous use temporally precedes purchasing. The usage begins with the free of charge basic membership. Thereafter, if the SVW is perceived attractive enough that usage is continued. At some point of the usage, the user may want to purchase credits to be used for virtual items or a premium membership.

Taken together, the proposed relationship from use intention to purchase intention is theoretically supported by Hunt (2002, 127) who claims the temporal sequence is a manifestation of a causal relationship. It is also supported by Venkatesh & Agarwal (2006) who have empirically verified website usage as being a predictor of the intention to purchase from the website. Furthermore Lu

et al. (2010) verified use intention as a predictor of purchasing in C2C online communities. Hence, the respective hypothesis is postulated as follows:

H9: Continuous use intention positively affects the purchase intention.

Prior research provides evidence that the key members from one's social network may exert normative influence upon one's own individual innovation behaviour (Valente, 1995). Since purchasing behaviour in virtual worlds is, to a large extent, an un-investigated area of online consumer behaviour, the literature does not provide much prior information on the factors that drive purchasing by individuals in virtual worlds. In particular, the role of social influence in determining purchasing behaviour is scarce. Shin (2008) found subjective norms to be the primary driver of the transaction intention. Also Guo and Barnes (2009) have suggested that social influence would contribute to a user's intention to buy virtual items. Lehdonvirta et al. (2009) discuss the role of social status with regard to consuming virtual goods and services. However, these studies focus on normative pressure rather than elucidating the effects stemming from perceived network effects. Since the disposition of the subjective norm construct used in this study is related to using Habbo rather than virtual purchasing behaviour, the subjective norm construct is not used to predict purchasing behaviour.

Virtual items can be used for showing status, exhibiting self-expression or can be traded with other users (see Lehdonvirta et al., 2009). The premium memberships give users more options to customise their avatars and the opportunity to include more people as their 'friends'. Yet virtual items and services are not network goods in a traditional sense i.e. the number of virtual items sold would mechanistically increase the unit value, the number of people involved in the SVW increases the value of virtual possessions by showing status and exhibiting self-expression. This can be assumed to be especially salient for those users with whom an individual particularly wants to interact. Childers and Rao (1992) suggest socially proximal referents are important in the consumption of luxury goods, i.e. are not commonly owned or necessary. Only a minority of the users of the SVW examined here uses real money for virtual items and services and thus they can be considered to have aspects of luxury inside the virtual environment. Therefore, the presence of referents in the virtual environment can be assumed to increase the perceived value of virtual possessions in terms of gains in status and self-identification. As a result, the role of perceived network size in predicting the intention to purchase virtual items or services is hypothesised as follows:

H10: Perceived network size positively affects the purchase intention.

Social presence has been found to have a direct positive impact on users' online purchase intentions (Gefen & Straub, 2004; Hassanein & Head, 2007). Social presence has been found to reinforce trust in online environments and thus reducing the cognitive uncertainty associated with purchasing via the Internet (Dash & Saji, 2007).

Furthermore, as one use of Habbo is communication and social interaction, purchasing virtual items enables the means to further increase the information richness of the medium by decorating the avatar or receiving e.g. special dance moves available only for those users who have purchased the premium membership. Thus, social presence influences via two mechanisms, directly by influencing the perception of the trustworthiness and the empathy of the service – and thus reducing uncertainty about purchasing, and indirectly by increasing the value of Habbo as a communication medium and thus making purchasing more meaningful.

Prior literature examining the role of social presence in predicting purchasing behaviour on areas related to SVWs is scarce, yet it offers empirical evidence for a direct positive relationship between social presence and purchasing (Mäntymäki & Salo, 2010). As a result, it is plausible to interpret social presence as being a determinant of purchasing behaviour in the SVW context. As a result, the final hypothesis put forward is:

H11: Perceived social presence positively affects the purchase intention.

To summarise the hypotheses, the research model is presented in Figure 17. Since the influence of the moderating variables is not formally hypothesised, to keep the figure understandable, the moderating effects are not drawn with arrows.

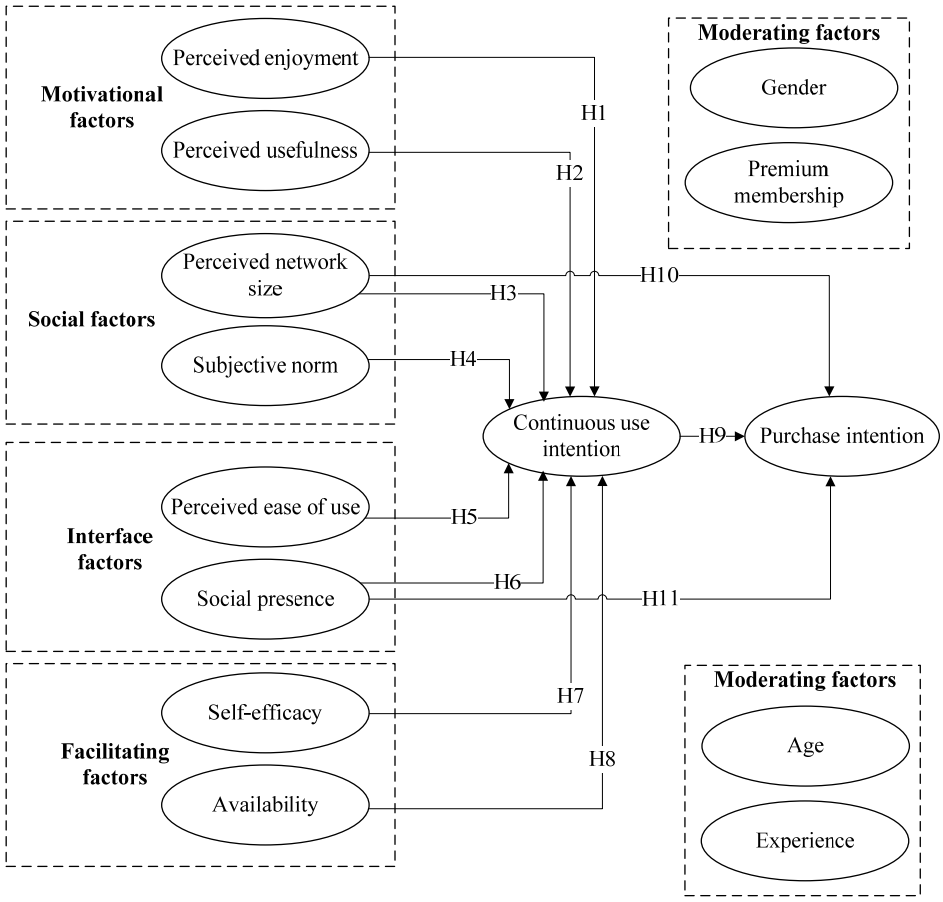

Figure 16 The empirical research model

Grounded on the use context of Habbo as well as the understanding gained from the literature reviews, the nomological net of the research was presented. Thereafter the hypotheses were developed. The following chapter presents the philosophical underpinnings and the methodological choices of the research.

6 METHODOLOGICAL STANDPOINTS

This chapter covers the methodological discussion. First the metatheoretical position of the study is illustrated. Since the empirical research was conducted among minors, a subchapter is dedicated to discussing some of the ethical aspects considered during the research process. Thereafter the research method, research design and instrument development are presented. The chapter concludes by reporting the data collection and data screening.

6.1 Metatheoretical positioning

The aim of the study is to investigate the determinants of two important post-adoption behaviours in the SVW context, continuous engagement in an SVW service and purchasing virtual items and value-added services. Respectively, the research questions were postulated as follows:

RQ1: What factors drive teens' continuous engagement in social virtual worlds?

RQ2: What factors drive teens' purchasing of virtual items and value-added services?

To answer these questions, this study seeks to identify a set of factors that *explain* the two dependent variables. Furthermore, *hypotheses* are put forward based on *a priori theory*, *quantitative survey* is used to collect the empirical data, and finally, the analysis is done using *multivariate statistics*, namely structural equation modeling (SEM).

The literature includes a number of ways to illustrate the metatheoretical positioning of the research (see Burrell & Morgan, 1979; Deetz, 1996; Morgan & Smircich, 1980). Irrespective of the metatheoretical position taken, understanding, acknowledging and explicating the underlying assumptions is important to give the reader an opportunity to evaluate the extent to which they may have influenced the research process.

Burrell and Morgan (1979) viewed research approaches in the social sciences as grounded on interrelated sets of assumptions on ontology, epistemology, human nature and methodology. In IS research, positivism and interpretivism have been considered the main paradigms (Chen & Hirschheim, 2004; Mingers, 2001; Mingers, 2003) yet recently critical realism has been suggested as a bridge between the two dominant paradigms (Smith, 2006).

Chen and Hirschheim (2004) have scrutinised the metatheoretical differences between positivism and interpretivism using the framework designed by Burrell and Morgan (1979). Ontologically, positivists believe that reality exists objectively and independently from human experience, while interpretivists emphasise the subjective meaning of the reality that is constructed and reconstructed through the process of human and social interaction (Burrell & Morgan, 1979). In brief, this study adopts the view that the world and its reality are independent of the individual observing them.

The epistemological assumptions are concerned with the grounds of knowledge (Burrell & Morgan, 1979, 1). Epistemologically, positivists favour the hypothetical deductive testability of theories as they believe that scientific knowledge should allow for the verification or falsification of theories and seek generalisable results (Chen & Hirschheim, 2004, 201). Causal relationships are usually presented and a tight coupling among explanation, prediction and control is expected (Orlikowski & Baroudi, 1991). Interpretivists, on the other hand, view science, as well as reality, as being socially constructed and thus argue that scientific inquiry should not include assume hypothetic-deductive reasoning but strive for an understanding of human and social interaction through which a subjective meaning of reality can be constructed (Walsham, 1995).

The determinism–voluntarism continuum represents underlying assumptions about human nature. In the determinist view extreme human activity is determined by the environment, whereas voluntarism views human beings having free will (Burrell & Morgan, 1979). In this research, human behaviour is seen as deterministic i.e. it is influenced by e.g. the factors that were hypothesised in the previous chapter.

Methodologically, a positivist assumption is that in order to test hypothetic-deductive theory, research should take a value-free position and employ objective measurement to collect research evidence (Chen & Hirschheim, 2004, 201). The role of values in scientific inquiry indicates what Collins and Hussey (2003) refer to as axiological assumptions. A quantitative method such as the survey is a typical positivist instrument. Interpretivists, in contrast, argue that to understand the meaning embedded in human and social interaction, researchers need to engage in the social setting investigated and learn how interaction takes place from the participants' perspective (Chen & Hirschheim, 2004, 201).

Finally, Chen and Hirschheim (2004, 201) argue that "in brief, positivist research is mostly depicted through: 1) the formulation of hypotheses, models, or causal relationships among constructs; 2) the use of quantitative methods, although not always necessary, that test theories or hypotheses; and 3) researchers' objective, value-free interpretation."

Deetz (1996) used two continua to exemplify the metatheoretical position of research. According to Deetz, the first distinction can be based on the origins of

the concept and problem statements in the research process. In the ‘local/emergent’ end, the problems and concepts are developed together with e.g. the members of the organisation examined, whereas at the other extreme they come from the researcher and are usually applied to the context to the study. The vertical dimension describes how research relates to the social discourses regarding e.g. the dominant method for the structuring of knowledge, social relations and identities within a research community, the organisation examined and/or the wider community (Järvinen, 2004). This approach has certain analogies with Max Weber’s thinking on whether equilibrium or disequilibrium is the ‘natural’ state in economic life (Weber, 2002). The dissension dimension represents research that consider struggle, conflict and tensions to be the natural state whereas the consensus pole draws attention to research programs that seek order and treat order production as the dominant feature of natural and social systems (Deetz, 1996, 197).

Using the categorisation by Deetz (1996, 198) the present study would fall into the normative category (see Figure 18). However, it does not represent theory-testing research in a pure sense. More accurately, the aim is to develop an integrative framework based on prior models and finally test the applicability of the developed framework. In addition, as regards the origins of the concept and problems in the horizontal axis, the research process has also been influenced by factors other than the researcher alone.

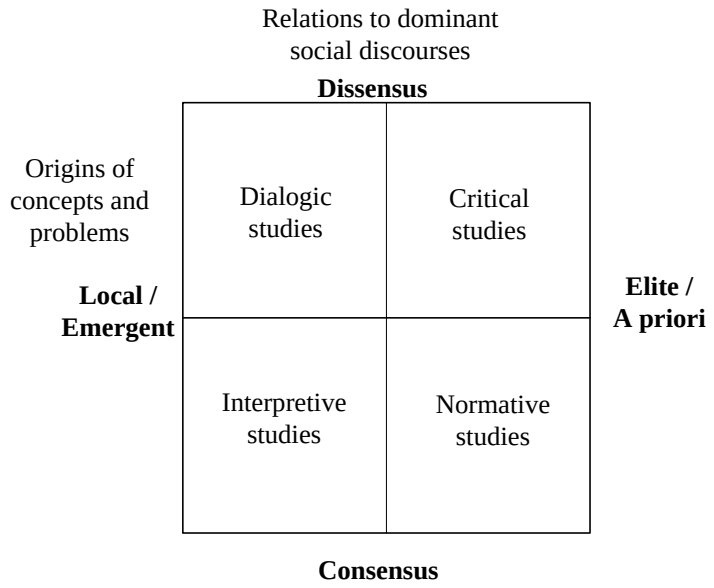

Figure 17 Contrasting Dimensions from the Metatheory of Representational Practices (Deetz, 1996, 198)

To conclude the metatheoretical discussion, the approach taken could be labelled as pragmatist as it argues that 'pure' positivist research is seldom, if ever, conducted in social sciences, including IS. Furthermore, as argued by Weber (2004), the distinctions between positivism and interpretivism are, to some extent, based more on rhetoric than on fundamental ontological and epistemological differences. Thus, the Kuhnian way of interpreting paradigms as something that researchers use to make better sense of the world for a certain period of time is favoured here (Kuhn, 1970). In addition, the Kuhnian view that paradigms do not rise or fall in a vacuum but that science is influenced by a number of 'external' factors such as economy and society (see Longino, 2002, 1-41) is accepted with regard to this study.

Within these premises the present research falls into the positivist category based on its metatheoretical position and also because it fits into the more practical characteristics suggested by Chen and Hirschheim (2004). However, positivism is not applied in its strictest sense for instance in terms of what is needed for true causal explanation (cf. Hunt, 2002) or the generalisability of the findings (Lee & Baskerville, 2003). More accurately, positivism is here viewed as a system for providing tools and guidelines to answer the research questions. As a result, the approach taken in this research has certain analogies to the post-positivist view (see e.g. Guba, 1990; Wildemuth, 1993).

6.2 Ethical considerations

The main ethical issue with this study was the fact that most of the respondents were under 18 years old and, according to Finnish legislation, considered minors. The main ethical consideration was to ensure that responding to the survey did not possess any risk or harm to the respondents. To meet this goal, it was decided to attempt to minimise any influence conducting the research could have on the respondents and select the research method accordingly. Furthermore, an equally important goal was to ensure the anonymity of the respondents. The ethical aspect played a central role in determining the research method.

The ethical guidelines regarding the anonymity of the respondents and approval procedures needed given by the Finnish Youth Research Society (FYRS) were adopted in the research design and FYRS was one of the academic affiliations of the survey. No identification data was used in selecting the sample nor collected from the respondents. Neither the real names nor Habbo names of the respondents were asked for in the survey. Furthermore, personal or potentially sensitive topics were not included in the survey. Except for the background information, gender, age and number of household members, the questions of the survey were solely related to the users' perceptions of Habbo and their behaviour inside the SVW.

6.3 Research Method

The research method used in this study is survey. According to Pinsonneault & Kraemer (1993) survey has three distinct characteristics: 1) It is designed to produce quantitative descriptions of some aspect of the study population 2) The principal means of collecting information is conducted by asking people structured predefined questions 3) Third the information is normally asked from only a fraction of the study population, i.e. a sample (see also Fowler, 2002).

As argued by Pinsonneault & Kraemer (1993) survey research can be used for different purposes, namely to explore, to describe or to explain. The aim of survey research used in explanation is to test theory and causal relationships. An exploratory survey focuses on determining relevant concepts and measurements, whereas descriptive surveys aim at describing a distribution and possibly making a comparison between the distributions. Furthermore, based on the temporal dimension in the research design, surveys can be divided into longitudinal and cross-sectional surveys (Fowler, 2002). In this research the empirical study was collected for one point in time and thus represents a cross-sectional survey.

The survey research used in this research can be considered mostly explanatory since it used constructs that have been developed in prior literature.

In addition, the theoretical constituents of the presented research model have been tested by previous research, although in contexts other than social virtual worlds. All items included in the survey are based on prior literature yet, due to the contextual differences, some adaptations were made. Despite the somewhat novel research context, theoretical support for all hypothesised relationships exists. Therefore, explanatory is a more accurate description of the approach taken in this study than exploratory survey. Furthermore, a descriptive survey was not considered the best alternative since the aim is to make a theoretical contribution. (Pinsonneault & Kraemer, 1993; Whetten, 1989.)

Survey was selected as the research method since the interest was to examine the relationships between constructs and to predict the dependent variables, i.e. to examine what factors determine continuous use and purchasing behaviour in a virtual world setting. As pointed out by Pinsonneault & Kraemer (1993, 78):

> *"survey research is especially well-suited for answering questions about what, how much and how many, and to a greater extent than is commonly understood, questions about how and why."*

Self-evidently other methods e.g. interviews or an ethnographic approach could have provided an alternative angle to approach the phenomenon of interest. However, to empirically measure the relationships between the research constructs, survey was considered more appropriate.

From a practical perspective, for the needs of this study no suitable secondary data suitable was available, thus the collecting of primary data was necessary. Finally, an important factor affecting the research method selection was the willingness of Sulake Corporation to facilitate the survey at nine Habbo portals. Finally, from an ethical standpoint the aim was to minimise any potential influence participating in the research could have on the subjects and the methods of survey research were viewed as fulfilling this criterion.

6.4 Research Design

Research design can be viewed as encompassing the strategy used to answer the research questions. The three main issues that were considered with regard to the research design were the choice between cross-sectional and longitudinal research, unit of analysis and the decision of the respondents of the survey research (Fowler, 2002; see Malhotra & Grover, 1998).

The research design applied here can be described as cross-sectional since it examines the relationships between the constructs with data from one point in time. This is in contrast to longitudinal research where the data is collected at several points of time. A longitudinal approach enables the examining of how the construct evolves over time and is thus preferred, especially if the aim is to

examine causality in its strictest sense. Longitudinal research is particularly suitable for examining the factors that are causes or consequences of the changes in the constructs. The environment within SVWs is rather dynamic due to new features, events and people being introduced. The examined constructs are related to individuals' perceptions and beliefs, which are normally influenced by various factors. Hence, identifying the actual causes of the changes in the research constructs occurring over time would have likely been problematic in the context of this research. Since the aim of this study was more to investigate the relationships between the research constructs than to examine what causes the changes in the construct, a cross-sectional research design was selected.

The second main issue related to research design was determining the unit of analysis, i.e. the level on which the empirical data is collected. Since the focus of this research is on the individual user, the choice of unit of analysis was rather clear. The survey instrument was designed to be appropriate for the unit of analysis.

The third issue to be considered was deciding from where the empirical data would be collected. Since the phenomena of interest are continuous SVW use and purchase behaviour, existing SVW users were selected to act as the respondents. Habbo was selected as the SVW where the survey was conducted since the operator, Sulake Corporation, was willing to facilitate the data collection.

The literature offers several guidelines on how to conduct the survey research (see e.g. Fowler, 2002). Malhotra and Grover (1998) suggest a following checklist for conducting and reporting survey research:

- Is the unit of analysis clearly defined for the study?
- Does the instrumentation consistently reflect that unit of analysis?
- Is the respondent(s) chosen appropriate for the research question?
- Is any form of triangulation used to cross validate results?
- Are multi-item variables used?
- Is content validity assessed?
- Is field-based pretesting of measures performed?
- Is reliability assessed?
- Is construct validity assessed?
- Is pilot data used for purifying measures or are existing validated measures adapted?
- Are confirmatory methods used?
- Is the sample frame defined and justified?
- Is random sampling used from the sample frame?
- Is the response rate over 20%?
- Is non-response bias estimated?
- Are attempts made to establish internal validity of the findings?

- Is there sufficient statistical power to reduce statistical conclusion error?

In this study, the guidelines by Malhotra and Grover (1998) have been followed in reporting the activities in the research process and the results.

An important aspect related to the research design was that data collection was designed to accommodate the needs of two researchers, both interested in understanding the factors driving continuous use in the SVW context. The survey instrument contained items for the needs of both researchers' individually and items that were to be used together in e.g. joint publications.

In Merikivi & Mäntymäki (2009) a potential research model for understanding continuous use was developed. The model was refined and empirically tested in Mäntymäki & Merikivi 2010 (2010b) and Mäntymäki et al. (forthcoming). Mäntymäki & Merikivi (2010a) departed from using TPB and tested a model grounded on TAM.

Purchasing behaviour has been incorporated into the investigation in three papers. Mäntymäki (2009) first presented purchasing behaviour as an outcome of a set of the same variables influencing continuous usage. Drawing on this, Mäntymäki & Salo forthcoming) have revised the research model and extended the scope of the empirical testing.

6.5 Measurement

Since the constructs of the research model are latent i.e. cannot be directly observed, all constructs were measured with multiple observed items. A seven-point Likert-scale anchoring from Strongly Agree to Strongly Disagree was used in the measurement, apart from the perceived network size construct where the anchors were None and All. The questions were made as easy to understand as possible for teenagers in order to reduce potential biases in responses and to reduce uncompleted questionnaires. The measurement items with references to the respective literature are presented in Table 18.

All the measurement items were drawn from prior IS literature following the recommendation by Boudreau et al. (2001) to ensure construct validity. Since most of the constructs have been rather extensively used in previous research, only the main sources are presented in Table 18.

The items measuring continuous use intention are based on Bhattacherjee (2001b) and Hsieh et al. (2008) and the items measuring purchase intention come from Venkatesh & Davis (2000) and Bhattacherjee (2001b). Perceived usefulness was taken from Davis (1989) and specifically modified to reflect the utility related to social interaction and making friends, That was done in a way similar to Li et al. (2010) and Lin & Bhattacherjee (2008) in the context of instant messaging. The items measuring perceived enjoyment were adopted from van

der Hejden (2004) and Venkatesh & Davis (2000). The items for perceived network size were taken from Lin & Bhattacherjee (2008). The measurement of subjective norms was based on Venkatesh and Davis (2000) and Venkatesh et al. (2003). The items for perceived ease of use were drawn from Davis et al. (1989). The self-efficacy construct was based on Bandura (1997) using the operationalisations from Compeau & Higgings (1995) and Venkatesh et al. (2003). The measures for availability were adopted from Hsieh et al. (2008) and for social presence from Cyr et al. (2007) and Hassanein & Head (2007). In addition to the constructs of the research model, two additional constructs, perceived behavioural control (PBC) and attitude (ATT) were included to enable the comparing of the explanatory power of the model with TPB. The items for both additional constructs are adapted from Ajzen (1991). The survey as a whole is attached in Appendix 1. The survey was designed for a more extensive research project, which included questions for two researchers. Therefore, only a part of the items for each construct were included in this study.

All items were measured with reflective indicators. The use of formative measures has attracted a substantive attention in e.g. the IS and marketing literature (Diamantopoulos & Winklhofer, 2001; Petter et al., 2007) but also raised concerns (Bagozzi, 2007; Wilcox et al., 2008). All research constructs except perceived network size have been consistently viewed as reflective in prior literature and they are also measured with reflective indicators in this study. As the items of the perceived network size construct aim to capture the influence of different groups in one's personal network, the construct could also potentially be modelled as formative. Hence, the choice between formative and reflective measurement was made based on the guidelines provided in the literature (see e.g. Diamantopoulos & Winklhofer, 2001; Petter et al., 2007). First, perceived network size has been measured with reflective indicators (Hsieh et al., 2008; Lin & Bhattacherjee, 2008). Second, dropping one of the measurement items would not change the conceptual domain of the construct as could happen with a clearly formative construct (Diamantopoulos & Winklhofer, 2001; Petter et al., 2007). Third and finally, in terms of the nomological content of the items, the groups represented by the items can have overlapping members in contrast to e.g. Compeau et al. (2007). As argued by Kim et al. (2010) in the absence of especially strong arguments for using formative measurement, reflective measurement should be preferred. Based on the reasons given above, perceived network size was modelled as a reflective construct.

Table 18 The survey instrument

	Measurement item	***Source***
CUI1	I intend to continue using Habbo during the next three months.	Bhattacherjee (2001b); Hsieh et al. (2008)
CUI2	I intend to continue using Habbo frequently during the next three months.	
CUI3	I will keep on using Habbo in the future.	
PURCH1	I intend to purchase Habbo items and/or Habbo Club memberships shortly.	Bhattacherjee (2001b); Venkatesh & Davis (2000)
PURCH2	I predict I will purchase Habbo items and/or Habbo Club memberships in the short term.	
PURCH3	I will frequently purchase Habbo items and/or Habbo Club memberships in the future.	
PEOU1	Using Habbo to communicate with others is clear and understandable.	Davis et al. (1989); van der Heijden (2004)
PEOU2	Navigation through the menus and toolbars in Habbo is easy to do.	
PEOU3	I feel that Habbo's interface is easy to learn.	
PU1	Using Habbo... Helps me stay in close touch with my friends.	Davis (1989); Li et al. (2010)
PU2	Helps me stay in close touch with people I know.	
PU3	Helps me to communicate easier with people I know.	
PU4	Helps me to make new friends more efficiently.	
ENJ1	It is enjoyable to use Habbo.	van der Heijden (2004); Venkatesh (2000)
ENJ2	It is fun to use Habbo.	
ENJ3	It is entertaining to use Habbo.	
PNS1	How many of your friends use Habbo? (none…all)	Lin & Bhattacherjee (2008)
PNS2	How many of yours peers use Habbo? (none…all)	
PNS3	How many people in your environment use Habbo? (none…all)	
SN1	People who influence me think I should use Habbo.	Venkatesh & Davis (2000); Venkatesh et al. (2003)
SN2	People who are important to me think I should use Habbo.	
SE1	I feel comfortable using Habbo on my own.	Compeau & Higgins (1995); Venkatesh et al. (2003)
SE2	I can easily operate in Habbo on my own.	
SE3	I feel comfortable using Habbo, even if there is no one around me to tell how to use it.	
AVA1	I don't always get to use Habbo because my parents won't allow me.	Hsieh et al. (2008)

AVA2	I cannot use Habbo when I want to.	Hsieh et al. (2008)
SP1	There is a sense of human contact in Habbo.	Cyr et al. (2007); Hassanein & Head (2007)
SP2	There is a sense of human warmth in Habbo.	
SP3	There is a sense of sociability in Habbo.	
PBC1	I have the resources, knowledge, and ability to use Habbo.	Ajzen (1991)
PBC2	I can use Habbo.	
PBC3	I know how to use Habbo.	
PBC4	Using Habbo it entirely within my control.	
ATT1	All things considered, using Habbo is… Extremely bad…good	Ajzen (1991)
ATT2	Extremely dissatisfying….satisfying	
ATT3	Extremely displeasing...pleasing	
ATT4	Extremely terrible…delightful	

6.6 Data collection

The data collection was done with on online survey from the users of eight Habbo portals. In total, the survey was opened 62 395 times of which 31 435 respondents returned the survey. Hence, the overall response rate had a percentage of 50.3. As the data collection was designed to serve the entire research project and two researchers, only the data from the Finnish portal was used in the analysis for this study.

Online surveys have become increasingly popular since they have proven to be a cost-effective and efficient way to collect large amounts of data (see e.g. Schonlau et al., 2009; Shropshire et al., 2009). Online surveys are part of a modern researcher's toolkit (Witte, 2009, 285). Despite their several advantages over traditional mail surveys, online surveys have been have been criticised for e.g. their limited facilitation of randomised sampling because this leads to the self-selection of the respondents (Wright, 2005).

An online survey was selected for three primary reasons. First, reaching the desired target population with a traditional mail survey would have been difficult (Garton et al., 1999). Moreover, an online survey was considered an applicable way to reach the SVW users as they are actually using the SVW and are thus mentally oriented to answering the questions.

The third reason for conducting an online survey was the need to ensure the total anonymity of the respondents; posting a mail survey to a randomised population of teenagers to reach a similar number of responses would have been both time-consuming and too expensive. As everyone willing to participate was included, the sampling method can be labelled voluntary sampling. Since random

sampling was not conducted, generalising the findings in a strict statistical sense was not a recommended approach.

An invitation to participate in the survey including a short message to help the researcher and a link to the actual questionnaire was published on the main page of the Habbo portal by the operator. No incentives or rewards of any kind were offered to the respondents. A web-based online survey tool Webropol[9] was used in the survey. The survey was published in July 2008 since during that time most teens are on summer holidays from schools and presumably have more free time to spend in Habbo and also respond to the survey. The survey was available for one week. Multiple responses from the same IP address were prevented by the survey software. The survey was divided into five pages. The first page included a short introduction with the contact details of the researchers encouraging participation in the survey.

6.7 Data screening

The preliminary data screening was done with PASW 18 software. To assess the potential non-response bias the background information of the first and last 150 responses were compared (Grover et al., 1993). A t-test did not detect a difference between the early and late respondents. Despite the measures taken to reduce the risk for biased results, the respondents of the survey are likely to represent more active Habbo users rather than passive ones. However, since the focus of the research is specifically on active SVW usage, the data collection method can be considered appropriate and the potential bias towards the active users does not cause a problem.

The survey was opened 8928 times. 3265 respondents proceeded to the final page and submitted the survey. This yielded a response rate of 36.6 per cent. The gender distribution is presented in Table 19.

Table 19 Gender distribution of the respondents

Gender	***Frequency***	***Percent***
Female	1860	57.0
Male	1347	41.3
Missing	58	1.8
Total	3265	100.0

9 www.webropol.com

Table 20 and Figure 18 illustrate the age of the respondents. As can be seen from the table and figure 12 and 13 are the most common ages.

Table 20 Age distribution of the respondents

Age	***Frequency***	***Percent***
Missing	59	1.8
<10	98	3.0
10	260	8.0
11	504	15.4
12	611	18.7
13	600	18.4
14	438	13.4
15	292	8.9
16	154	4.7
17	71	2.2
18	68	2.1
>19	110	3.4
Total	3265	100.0

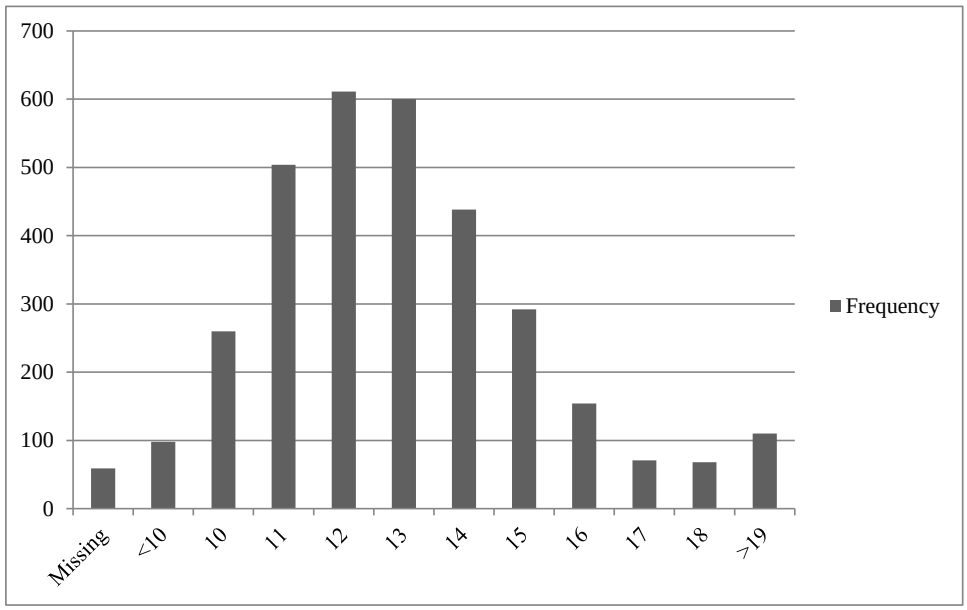

Figure 18 Age distribution of the respondents

The cross-tabulation of age and gender shows that female respondents form the majority in all except the oldest age category.

Table 21 Cross-tabulation of age and gender

Age	***Female***	***Percent***	***Male***	***Percent***
Missing	19	54.0	16	46.0
<10	47	51.0	45	49.0
10	139	53.0	121	47.0
11	307	61.0	194	39.0
12	364	60.0	246	40.0
13	366	62.0	227	38.0
14	260	60.0	176	40.0
15	152	53.0	135	47.0
16	83	55.0	67	45.0
17	36	51.0	34	49.0
18	39	57.0	29	43.0
>19	48	46.0	57	54.0

As regards the respondents' length of experience, 1–2 years was the most common category, followed by 2–3 years.

Table 22 Respondents' length of experience of using Habbo

Length of experience	***Frequency***	***Percent***
Missing	92	2.8
Less than 1 month	112	3.4
1–6 months	293	9.0
6–12 months	252	7.7
1–2 years	639	19.6
2–3 years	568	17.4
3–4 years	517	15.8
4–5 years	369	11.3
More than 5 years	423	13.0
Total	3265	100.0

Altogether, 15.2 percent of the respondents either did not state the length of their experience or had been using Habbo for less than 6 months. At the other end, 13 percent of the respondents had had more than 5 years of experience of using Habbo.

Table 23 Places where Habbo is used

Where do you log into Habbo from most often?	***Frequency***	***Percent***
Missing	121	3.7
Home	2979	91.2
School	27	0.8
Friend's house	29	0.9
Library	28	0.9
Youth center	9	0.3
Internet café	16	0.5
Other	56	1.7
Total	3265	100.0

As shown in Table 23, most of the respondents use Habbo from home. This reflects the fact that computers are widely adopted in Finnish households.

Table 24 Habbo Club membership

Habbo Club membership	***Frequency***	***Percent***
Yes, current member	1371	42.0
No, never been	666	20.4
No, but have been	1173	35.9
Missing	55	1.7
Total	3265	100.0

The majority of the respondents had firsthand experience of the premium membership i.e. Habbo Club. The proportion is likely to be considerably higher than in the whole Habbo user population. Figure 19 illustrates the proportion of premium members in a graph format.

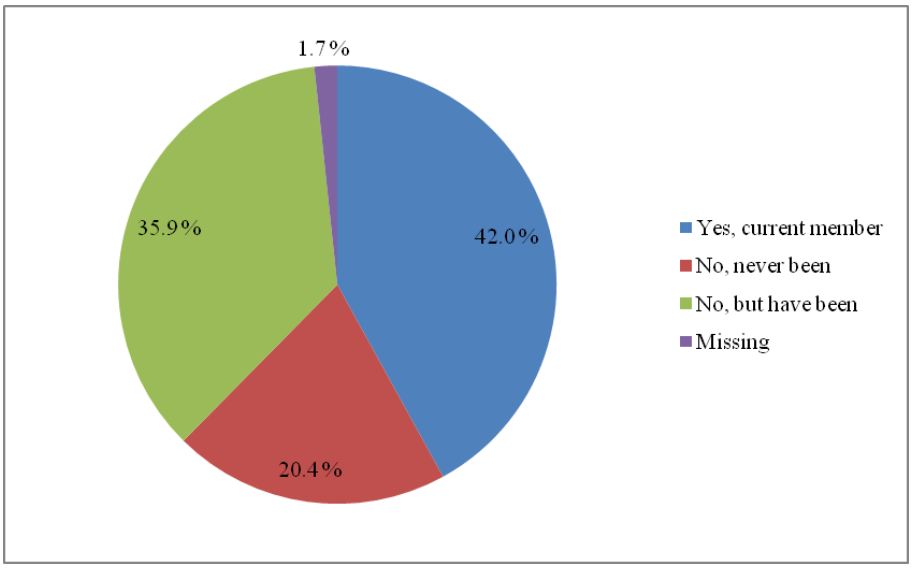

Figure 19 Habbo Club memberships in all responses

To further ensure the reliability of the results and since the selected analysis method does not allow the dataset to include missing values, only fully completed responses from the original dataset were included in the final sample that was used in the analysis. Furthermore since Habbo is targeted towards teenagers and since, according to Sulake Corporation, 90 % of the users are aged between 13 and 18, only respondents within this range were included in the analysis. As a result, the final sample size was 1045. The age and gender distribution is presented in cross-tabulated form in Table 25.

Table 25 Gender and age distribution of the final sample cross-tabulated

		Gender		***Total***
Age		***Female***	***Male***	
13	Count	244	145	389
	Percentage	63.0	37.0	100.0
14	Count	184	111	295
	Percentage	62.0	38.0	100.0
15	Count	100	73	173
	Percentage	58.0	42.0	100.0
16	Count	54	46	100
	Percentage	54.0	46.0	100.0
17	Count	30	22	52
	Percentage	58.0	42.0	100.0
18	Count	19	17	36
	Percentage	53.0	47.0	100.0
Total	Count	631	414	1045
	Percentage	60.0	40.0	100.0

As can be seen from table 26, the share of Habbo Club members in the final dataset is on a similar level to that data which includes all respondents, indicating that the Club members are not overrepresented in the final sample.

Table 26 Habbo Club members in the final sample

Habbo Club membership	***Frequency***	***Percent***
Yes, current member	458	43.8
No, never been	178	17.0
No, but have been	402	38.5
Missing	7	0.7
Total	1045	100.0

This chapter presented the methodological choices, the development of the survey instrument as well as the procedures for the data collection and the results of the data screening. The next chapter proceeds to the analysis of the data.

7 DATA ANALYSIS

This chapter presents the data analysis. The chapter begins by elaborating on the method of data analysis and is followed by a discussion of its reliability and validity. After establishing reliability and validity, the results of the data analysis are presented and the results from the testing of the hypotheses are summarised. The chapter concludes with quantitative and qualitative post-hoc analyses in order to further validate the results obtained.

7.1 Method of Analysis

Structural equation modeling (SEM) was employed in the data analysis. SEM has become popular among researchers since it allows complex phenomena to be statistically modelled and tested. SEM enables the testing of research models with latent unobservable constructs that are measured with multiple indicators and take into account the measurement error. Moreover, SEM offers various means to examine the reliability and validity of the results and offers an extensive set of fit indices to evaluate how well the model fits the empirical data. As SEM is generally considered a confirmatory rather than exploratory procedure, it is suitable for research hypotheses-testing research such as the approach taken in the current study. (Byrne, 2001; Tabachnick & Fidell, 2007.)

Compared to so-called first-generation statistical analysis such as multiple regression, the advantages of SEM with regard to model fit statistics and the simultaneous analysis of all the structural paths in the model have made SEM one of the most extensively used statistical approaches in social sciences. Among IS scholars, SEM is a widely adopted technique for statistical analysis (Chin & Todd, 1995; Chin, 1998).

SEM can be divided into covariance-based and component-based approaches. Covariance-based SEM packages such as Amos, LISREL and EQS focus on measuring the extent to which the covariances predicted by the model correspond to the observed covariances in the data (see e.g. Tabachnick & Fidell, 2007, 684-686), whereas partial least squares (PLS) takes a component-based approach (Reinartz et al., 2009). PLS has attracted attention in the IS field due to its abilities to overcome certain challenges associated with covariance-based SEM. In particular, PLS is considered suitable for small samples and working with non-

normal data. Furthermore, PLS is often favoured when the model includes formative measures (Chin, 1998; Marcoulides & Saunders, 2006; Sosik et al., 2009).

For this research, a covariance-based approach instead of PLS was selected for three reasons: First, the dataset is relatively large. Second, a covariance based approach offers an established set of statistics with which to examine the overall model fit. Third, the constructs were measured solely with reflective indicators. Additionally, covariance-based SEM can offer more accurate parameter estimates (Reinartz et al., 2009). In consequence, AMOS 18 software was selected for the data analysis.

Maximum-likelihood (ML) was used as the estimation method since it has proven robust when working with medium-sized or large samples. Additionally, ML has been found robust, even in cases where the normality assumptions are severely violated (Reinartz et al., 2009). As the univariate skewness and kurtosis of the data remained within the range suggested by Finney & DiStefano (2006) and given the large sample size, ML was considered the best estimation method for the current research.

The analysis was done by employing the two-step approach suggested by Anderson and Gerbing (1988). In the first stage, confirmatory factor analysis was performed on the final dataset for scale reliability and validity assessment and in order to examine how well the model fits the empirical data. In the second stage, path coefficients and the significance of the hypothesised relationships in the structural model were tested.

7.2 Reliability and validity

The literature offers several guidelines on how to evaluate and report the reliability and validity of the results (see e.g. Straub et al., 2004). Here, the specific focus is on content validity, nomological validity, convergent validity and discriminant validity as the key components of construct validity. Additionally, with regard to the reliability of the results, the risk of common method variance and the remedies applied are discussed. First of all, to ensure the best possible quality of the dataset, only the fully completed responses were included in the analysis. Furthermore, in structural equation modelling, different estimation methods were considered in order to ensure the reliability of the parameter estimates and to ensure that the results obtained are reliable.

Content validity refers to whether all the relevant aspects of the construct in question have been taken into account in the empirical investigation. As articulated by Cronbach and Meehl (1955, 282):

> *"Content validity is established by showing that the test items are a sample of a universe in which the investigator is interested"*.

In practice, content validity is established through literature reviews or expert interviews. Using measures verified by an extant prior research and measuring the constructs with multiple items in order to grasp all the relevant aspects of the construct are viewed as strengthening construct validity. Furthermore, various experts as well as SVW users were consulted in order to help explain the reasons for SVW use and virtual purchasing as well as to describe the social dynamics inside the virtual environment. Additionally, the survey instrument was commented on by the employees of Sulake Corporation in order to ensure that the questions were understandable for the target audience. During this process, some minor modifications were made and some of the initial constructs and items were dropped to reduce the time required to complete the survey. The original survey instrument was developed in English and translated into Finnish by the researcher and another Finnish IS researcher. Finally, the translations were double-checked by an employee of Sulake Corporation. Nevertheless, as argued by Straub et al. (2004, 387), this research practice lacks a clear consensus on the constituents of content validity. Thus determining whether the measures reported were adequate enough to ensure content validity is somewhat problematic. Therefore, content validity is less often discussed in the positivist IS research practice. However, these issues notwithstanding, measures to ensure content validity are likely to be beneficial in terms of construct validity.

Construct validity is specifically concerned with measurement between constructs. In addition, the measures of a construct should fit together in such a way that they capture the essence of a construct. Nomological, convergent and discriminant validity can be viewed as representing different facets of construct validity. In practice, convergent and discriminant validity are frequently reported in IS research whereas the explicit evaluation of nomological validity is less common (Straub et al., 2004).

Nomological validity is concerned with whether the items measuring the constructs belong to the same 'nomological net' i.e. that they preferably stem from a well-developed theoretical research stream. The developed research model integrates several theoretical approaches, and all the measures have been adopted from the prior technology adoption research. Thus, empirical validation of the construct is viewed to further strengthen the nomological validity. The hypotheses were based on and made according to relationships empirically identified in prior research. In this research, the main method of ensuring nomological validity was to use only constructs and measures tested and validated in prior literature (Straub et al., 2004).

Piloting a survey instrument is encouraged to ensure construct validity (Boudreau et al., 2001). Thus, the survey instrument was tested among the users

of the Canadian Habbo portal before being published at the Finnish Habbo portal. Once the factorial structure was found to correspond to the theoretical constructs and the attaining of a satisfactory level of construct validity was verified, the survey was published in Finland.

Convergent and discriminant validity encompass the technical criteria for construct validity. Convergent validity indicates the degree to which the items of a scale that are theoretically related are also related in reality. A high internal consistency between the items of a construct that are measured with composite reliability has also been claimed to be proof of construct reliability (Straub et al., 2004). The convergent validity was evaluated based on three criteria: firstly, all indicator factor loadings should be significant and exceed 0.7. Secondly, composite reliabilities should exceed 0.80. Thirdly, the average variance extracted (AVE) by each construct should be greater than the variance due to measurement error (AVE > 0.50) (Fornell & Larcker, 1981). As can be seen from Table 27, the test for convergent validity was met as the lowest value for construct validity was 0.835 and an AVE 0.589 was the lowest for the availability construct. Altogether, the results exhibit a good level of convergent validity.

Table 27 Psychometric properties and convergent validity

Item	*Mean*	*Std. Dev.*	*Loading*	*Composite reliability*	*AVE*
CUI1	5.464	1.897	0.887	0.909	0.697
CUI2	4.884	2.100	0.886		
CUI3	5.295	1.929	0.856		
PURCH1	3.990	2.266	0.928	0.934	0.712
PURCH2	3.787	2.274	0.911		
PURCH3	4.455	2.270	0.884		
PEOU1	6.256	1.412	0.842	0.895	0.689
PEOU2	5.873	1.581	0.868		
PEOU3	5.804	1.672	0.87		
PU1	4.759	2.107	0.916	0.941	0.762
PU2	4.662	2.119	0.947		
PU3	4.659	2.108	0.879		
PU4	4.890	2.029	0.829		
ENJ1	5.593	1.585	0.884	0.935	0.713
ENJ2	5.433	1.598	0.925		
ENJ3	5.286	1.692	0.919		
PNS1	3.438	1.982	0.914	0.886	0.684
PNS2	3.900	1.922	0.787		
PNS3	3.286	1.968	0.845		
SN1	3.504	2.088	0.925	0.931	0.635
SN2	3.331	2.027	0.942		
SE1	6.259	1.404	0.92	0.943	0.717
SE2	6.292	1.343	0.919		
SE3	6.256	1.412	0.920		
AVA1	2.465	2.065	0.904	0.835	0.589
AVA2	2.767	2.130	0.786		
SP1	4.659	2.108	0.759	0.872	0.676
SP2	5.125	1.891	0.879		
SP3	5.001	1.828	0.857		

Discriminant validity reflects whether the items measure the construct in question or other constructs. As regards the discriminant validity, the square root of the AVE for each construct should exceed the correlation between that and any other construct (Fornell & Larcker, 1981). According to Fornell and Larcker (1981) this test of discriminant validity is stronger than the conventional chi-square difference test (see also Bhattacherjee, 2001b). As can be seen from Table 28, the measurement fulfils these criteria. The correlations for four pairs of constructs (CUI-ENJ, ENJ-PU, SP-ENJ, SN-PNS) were higher than 0.7. A

correlation of this magnitude can, under certain conditions, indicate that the measurement taps into the same construct. This is not a risk here the reasons being as follows. First, since the motivational factors like the social factors, are nomologically related, the correlation is expected from a theoretical perspective. Second, the correlation between perceived enjoyment and intention can be explained by the fact that the use of SVWs can be expected to be strongly intrinsically motivated. The correlation between social presence and perceived enjoyment indicates that human warmth and sociability is an important contributor to pleasure and enjoyment as empirically verified by Hassanein and Head (2007). To assess the discriminant validity, also on an item level, a principal component analysis (PCA) was conducted following the guidelines suggested by Straub (1989). The results indicated that all the items of each construct loaded higher on their intended construct than on other constructs. Furthermore, no cross-construct loading exceeding 0.5 was found, which also supports the discriminant validity of the measures. The results of the PCA are presented in Appendix 5. Taken together, the measures can be interpreted as showing a satisfactory level of discriminant validity.

Table 28 Correlations between the constructs[10]

	CUI	**PURCH**	**PEOU**	**PU**	**ENJ**	**PNS**	**SN**	**SE**	**AVA**	**SP**
CUI	**0.835**									
PURCH	0.640	**0.844**								
PEOU	0.578	0.387	**0.830**							
PU	0.557	0.538	0.437	**0.873**						
ENJ	0.723	0.524	0.564	0.708	**0.844**					
PNS	0.442	0.552	0.292	0.578	0.457	**0.827**				
SN	0.439	0.524	0.283	0.607	0.511	0.707	**0.797**			
SE	0.420	0.167	0.613	0.178	0.328	0.038	0.044	**0.847**		
AVA	0.139	0.321	-0.005	0.235	0.160	0.473	0.419	-0.126	**0.768**	
SP	0.632	0.502	0.537	0.676	0.738	0.455	0.517	0.322	0.194	**0.822**

Common method variance (CMV), defined as the variance that is attributable to the measurement method, rather than to the constructs the measures represent (Podsakoff et al., 2003, 879), has been seen as a potential problem in behavioural research (Podsakoff et al., 2003). In IS research the results concerning the potential problems caused by CMV are somewhat mixed; Malhotra et al. (2006) did find that CMV had little influence on the results technology acceptance studies, whereas Sharma et al. (2009) found that CMV had a more substantial

10 square roots of AVEs in the main diagonal

effect. Nevertheless, the risk of CMV should be taken seriously and measures should be taken to minimise its effects and to examine its potential effect on the results.

To reduce the risk of CMV, the responses were anonymous. Furthermore, the questions were formulated in as neutral a way as possible in order to reduce the potential effect of social desirability (Podsakoff et al., 2003). The potential effect of (CMV) was examined with CFA using Harman's one-factor approach presented by e.g. Malhotra et al. (2006). The fact that the fit for the single factor model was unacceptable (GFI=0,436; CFI 0,496; RMSEA=0,186) showed that CMV is not a major concern. Furthermore, since the Harman's one factor approach is known to be conservative in detecting biases, an additional CMV test was conducted by including an underlying common method factor in the research model (Podsakoff et al., 2003). A comparison of the loadings between the item and its theoretical construct and item and the common method factor indicated that all but four method factor loadings were not statistically significant and all the item-method loadings were significantly lower than the item-trait loadings. Moreover, the item loadings for the theoretical constructs remained on a good level. Altogether the tests indicate that common variance is not a major contaminant of the results and is thus unlikely to distort the interpretations.

7.3 Results of the analysis

Once the convergent and discriminant validity was established the fit statistics for the measurement model were examined. Covariance-based SEM provides a number of goodness-of fit indices to evaluate how well the model fits the empirical data. A non-significant chi-square value has traditionally been considered a basic criteria for good model fit. However, since large sample sizes and any departure from normality tend to inflate the chi-square, increasing the risk of type 2 error, a number of other indices to examine the model fit have been developed. (Anderson & Gerbing, 1988; Hair, 1992.) The most simplistic application of the chi-square is the normed chi-square (Cmin/DF), where the chi-square value is divided by the degrees of freedom. All the fit indices exceeded the recommended thresholds indicating a good model fit. Table 29 summarises the goodness-of-fit statistics and their respective thresholds with reference to the literature. Since the fit for the measurement model was found to meet the criteria, the analysis proceeded to examining the structural model. As can be seen from Table 29, the fit with the structural model was very good.

Table 29 Goodness-of-fit statistics

Index	***Measurement model***	***Structural model***	***Recommended cut-off***
Cmin/DF	2.989	3.081	< 3 (Bagozzi & Yi, 1988)
GFI	0.934	0.930	> 0.90 (Gefen et al., 2000)
AGFI	0.914	0.910	> 0.80 (Gefen et al., 2000)
CFI	0.976	0.974	> 0.90 (Byrne, 2001)
NFI	0.964	0.962	> 0.90 (Gefen et al., 2000)
TLI	0.970	0.969	> 0.90 (Tucker & Lewis, 1973)
SRMR	0.032	0.035	< 0.08 (Hu & Bentler, 1999)
RMSEA	0.044	0.045	< 0.06 (Hu & Bentler, 1999)

After the structural model with the hypothesised relationships was found to fit well to the data, the hypothesised paths were examined. The results of the structural model are presented in Figure 20. The model yielded a predictive power of 59.7 % for the continuous use intention and 49.4 % for the purchase intention. Furthermore, as the effect sizes for both the continuous use intention and the purchase intention are large, the model can be concluded as explaining a substantive amount of the variance in the dependent variables, thus exhibiting a good degree of predictive validity (Straub et al., 2004).

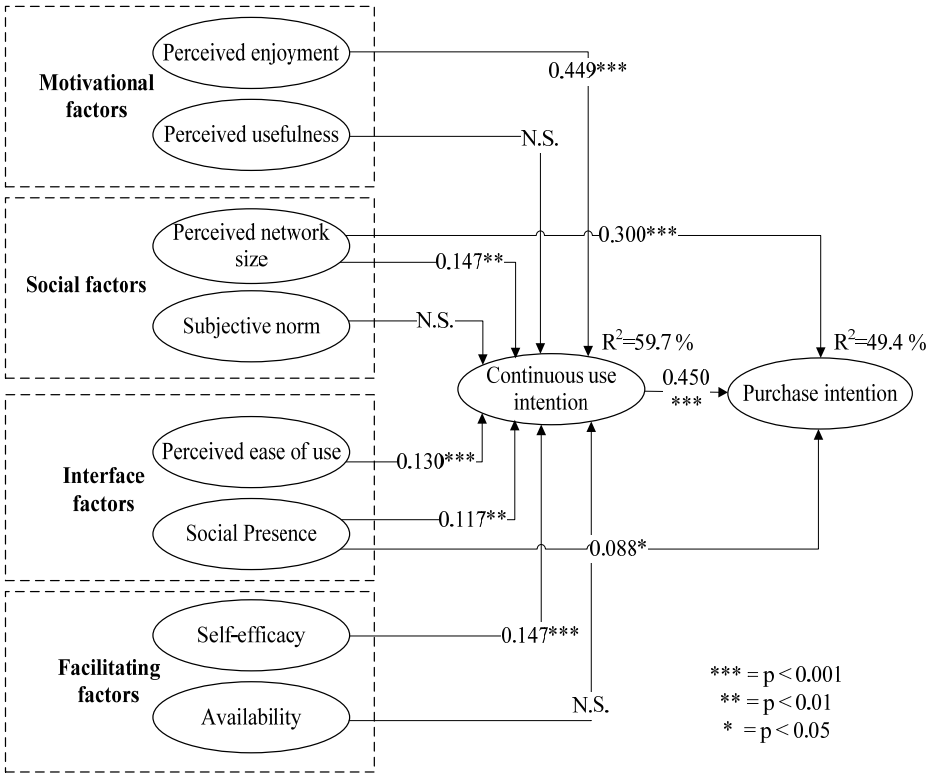

Figure 20 Results of the structural model

The results of testing the hypotheses are presented in Figure 20. With regard to the 11 hypothesised relationships, eight were statistically significant. Additionally, despite statistical significance, a standardised path coefficient below 0.1 level represents only a marginal effect on its dependent variable (Chin, 1998). Hence, the data cannot be viewed as providing sufficient empirical support for the path from social presence to the purchase intention (H11).

Table 30 Summary of the testing of hypotheses

Hypothesis	***Standardised path coeff.***	***Sig. level***	***Support***
H1: ENJ → CUI (+)	0.449	*** (p < .001)	Yes
H2: PU → CUI (+)	-0.009	N.S.	No
H3: PNS → CUI (+)	0.126	** (p < .01)	Yes
H4: SN → CUI (+)	0.025	N.S.	No
H5: PEOU → CUI (+)	0.130	*** (p < .001)	Yes
H6: SP → CUI (+)	0.117	** (p< .01)	Yes
H7: SE → CUI (+)	0.147	*** (p < .001)	Yes
H8: AVA → CUI (-)	0.001	N.S.	No
H9: CUI→ PURHC (+)	0.450	*** (p < .001)	Yes
H10: PNS → PURCH (+)	0.300	*** (p < .001)	Yes
H11: SP → PURCH (+)	0.088	* (p < .05)	No

After having tested the structural model, the effect of the background variables of age, gender and length of prior experience on the dependent variables were examined. The purchase intention was found to receive somewhat higher scores among the male respondents than females, whereas the continuous use intention was not influenced directly by gender. Experience did not have an effect on the continuous use intention but had a negative effect on the purchase intention. Age was found to have a weak negative relationship with the continuous use intention. Similarly, a statistically significant, yet weak, negative relationship between age and the purchase intention was found. Finally, since the intrinsic motivation was to find the main determinant of the continuous use intention, the potential influence of the background variables was examined. Gender had no influence on intrinsic motivation, whereas age was found to have a weak negative influence. Experience was also negatively associated with the intrinsic motivation.

The demographic variables have been viewed as acting as moderators in technology adoption (see e.g. Venkatesh et al., 2003), in addition to their direct influence, their potential moderating effects were examined with a multiple-group chi-square difference test suggested by Jöreskog and Sörbom (1993). A statistically significant chi-square difference (exceeding 3.84) between the groups in this test can be viewed as evidence of the existence of a moderating effect. Gender was found to moderate the relationships between perceived enjoyment and the continuous intention, the continuous use intention and the purchase intention as well as perceived network size. Age had a moderating effect only on the relationship between self-efficacy and the continuous use intention. In addition to the demographics, the effect of the length of prior experience and having a premium membership was examined. Length of prior experience moderated the relationships of self-efficacy and perceived ease of use

to the continuous use intention. Also the continuous use intention-purchase intention relationship was moderated by experience. Finally, having the premium membership was found to moderate the relationship between perceived network size and the purchase intention. A summary of the testing of the moderating effects is presented in Table 31.

Table 31 Summary of the testing of the moderating effects

Relationship	***Moderating effect***
ENJ → CUI (+)	Gender: Stronger among male respondents
CUI → PURCH (+)	Gender: Stronger among male respondents Experience: Stronger among more experienced respondents
PNS → PURCH (+)	Gender: Stronger among female respondents Premium membership: Stronger among premium members
SE → CUI (+)	Age: Stronger among older respondents Experience: Stronger among more experienced respondents

Since all of the hypothesised paths did not receive empirical support, Figure 21 below presents a summary of the revised research model where only the significant hypothesised relationships as well as the significant moderating effects are included.

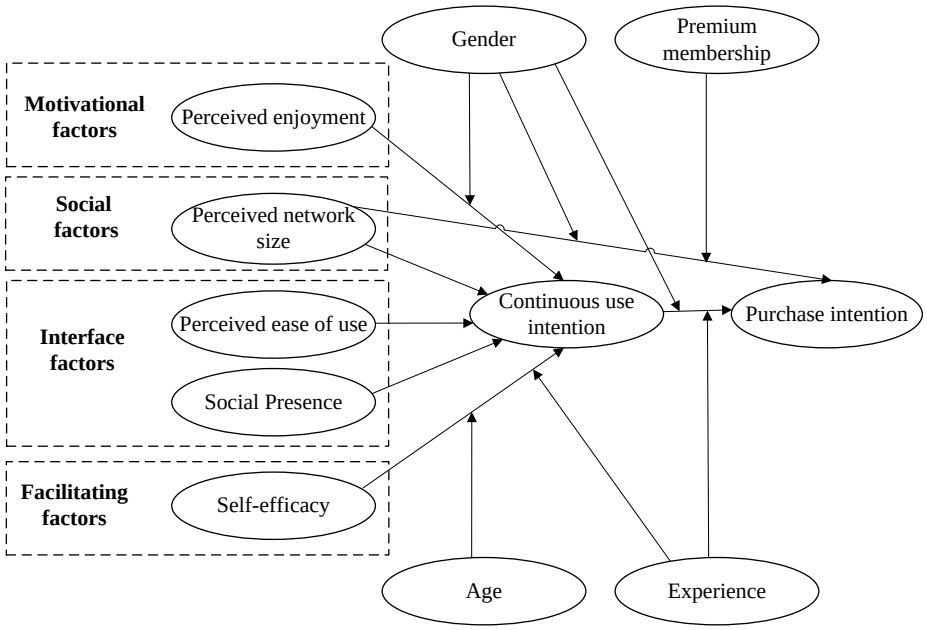

Figure 21 Revised research model with moderating effects

To avoid scrutinising the research model in a vacuum, the following subsection provides a point of reference by making a comparison between the model and alternative theoretical tools.

7.4 Quantitative post-hoc analysis

To evaluate the predictive ability of the developed model, a comparison between the research model and TAM, UTAUT and TPB was made. These models were selected since they have been extensively used in prior technology adoption as well as in examining the continuous use intention, and thus provide a good point of reference for comparisons. All the measures and constructs of the referent models met the criteria for convergent and discriminant validity. The tests of convergent and discriminant validity for TAM are presented in Appendices 6 and 7, for UTAUT they are presented in Appendices 8 and 9, and TPB in Appendices 10 and 11. Furthermore, the model fits were found to be acceptable with all the models, thus making the comparisons possible (see Appendix 12).

According to the correspondence principle, the comparison of predictive power was conducted for the continuous use intention since the referent models have been used to explain that behaviour, although the dispositions of the respective measures relate to use rather than purchasing. TAM yielded an explanatory power of 46.4 % for the continuous intention, whereas UTAUT

offered 48.9 % for the continuous use intention, while 45.4 % was predicted by TPB.

To conclude, the research model was found to outperform the referent models in its explanatory power and can thus be viewed as improving on them. On the other hand, the referent models are more parsimonious i.e. include a smaller number of independent variables. However, as the research on SVW use is still at a relatively early stage of its development, sacrificing some of the parsimony to gain a comprehensive picture of the influence of different factors is a justified approach. In the following subsection the validity of the components included in the research model is examined from a qualitative perspective.

7.5 Qualitative analysis

After the predictive validity of the suggested research model was verified, the feasibility of the factors included in the research model was examined with a qualitative content analysis. In this research qualitative analysis was used to *complement* the quantitative analysis. Thus the quantitative method was first in both priority and sequence (Morgan, 1998). Furthermore, the qualitative content analysis conducted here includes a minimal level of interpretation and does not fundamentally challenge the underlying positivist metatheoretical assumptions (see also Weber, 2004). Thus, regardless of whether paradigms are incommensurable (Kuhn, 1970), or whether methodological pluralism (see e.g. Mingers, 2001) can be accepted, the positivist view was followed within the whole study.

The central tenet of the research model was that continuous SVW use is predicted by motivational, social, interface and facilitating factors. To take a closer look into this issue, the survey instrument included an open ended question "*why do you use Habbo?"*

The responses were analysed by the researcher and coded based on the themes mentioned in the responses. This approach can be referred as to open coding (Strauss & Corbin, 1990, 61). The themes were allowed to emerge freely, i.e. when a new reason for the usage was mentioned, a respective code was established. Thus, no theoretical frameworks were used to form the codes. Multiple codes per response were used when the respondent mentioned several reasons. If the response was for example "*because it's fun, I meet my friends there"*, the respective codes were 'enjoyment' and 'existing friends'. However, the responses were not interpreted so as to examine the potential hierarchies in the reasons mentioned by a single respondent. After the coding, the frequencies were counted to see what reasons were most often mentioned by the respondents. Making new friends and interacting with existing friends were the most often

mentioned reasons for Habbo use. The next most frequently mentioned reason was coded as enjoyment, including the fun and pleasure gained from participation. Based on the frequencies found, the fourth and fifth most common reasons for using Habbo were spending time and chatting. The five most often mentioned reasons are presented in Figure 22.

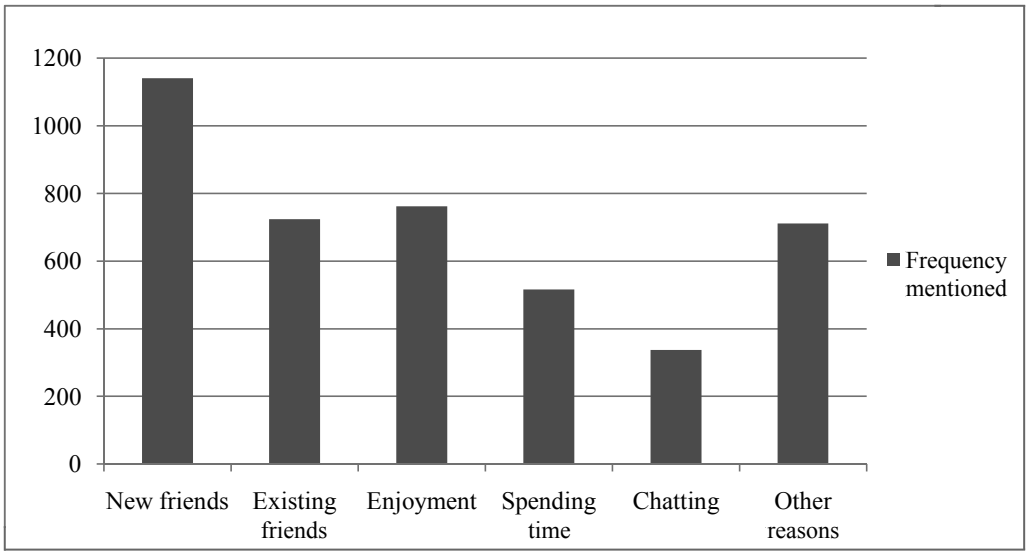

Figure 22 Reasons for using Habbo

To increase the transparency of the qualitative coding, Table 32 presents a set of examples of the responses included in the five main themes identified.

Table 32 Examples of the reasons for using Habbo

Code	***Examples of the content***
New friends	*"I meet new people there."* *"I have made new friends there."* *"In Habbo it's easy to make new friends."* *"It's a place to make virtual friends."*
Existing friends	*"It's a good place to meet with friends."* *"I can keep in touch with my friends who live elsewhere."* *"It's a great place to meet friends."*
Enjoyment	*"Because it's fun."* *"It's a cool place."* *"Because it's so much fun."* *"It's so much fun and I like it."*
Spending time	*"I spend my extra time there."* *"I just hang out there."* *"killing time"* *"…if I have nothing else to do"*
Chatting	*"Because it's a chat room that includes amusing functions."* *"Nice to chat with friends."* *"It's a cool avatar chat."* *"Chatting in e.g. MSN is so boring compared to Habbo."*

The qualitative responses demonstrate that friends and social interaction are an important reason for Habbo participation. This further validates the assumption that social factors are important in predicting SVW use. Furthermore, entertainment and hedonic reasons were frequently mentioned by the respondents, which support the inclusion of motivational factors, especially intrinsic motivation. The interface and the facilitating factors are inherently different from the motivational and social factors and are thus less likely explicitly to be mentioned when asking for reasons for SVW use but may, nonetheless, play a role in either enabling or inhibiting the usage.

As regards the reasons for purchasing behaviour, 500 randomly selected responses were analysed using the same approach as the reasons for usage. The most frequently mentioned reasons for purchasing Habbo items or premium memberships were increasing the entertainment value, the benefits obtained from the premium membership e.g. a wider selection of clothing and accessories, showing status and decorating one's virtual room. In addition, many respondents explicitly stated that they do not purchase virtual items or services. Figure 23 presents the most frequently mentioned themes in the form of a graph.

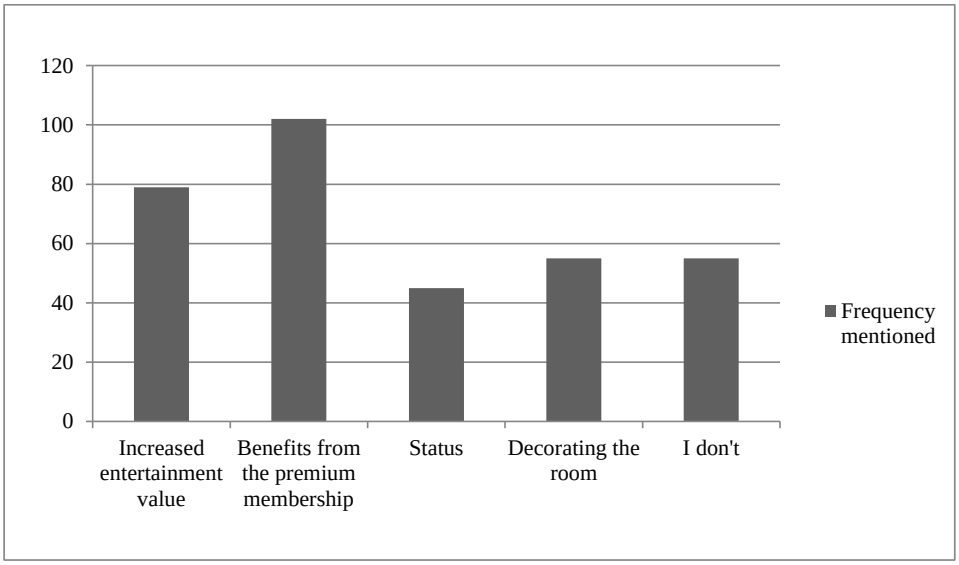

Figure 23 Reasons for purchasing Habbo items and services

To demonstrate the content of the most frequently mentioned themes describing the reasons for purchasing, Table 33 presents examples of the responses given in the survey.

Table 33 Examples of the reasons for purchasing Habbo items and services

Code	***Examples of the content***
Increased entertainment value	*"It's fun."* *"It makes Habbo so much more fun."* *"Without them (purchased items) Habbo would be boring."*
Benefits from the premium membership	*"I get all kinds of benefits, such as clothes."* *"For the Club members, things are better."* *"When I'm in the Club, I get cool hair styles and clothes."*
Status	*"To gain respect, not disrespect."* *"To show others I'm rich."* *"Because Club members are considered to have a higher status than the average user."*
Decorating the room	*"To make my room look nice."* *"Because I want to decorate my room."* *"The products make my room cozier."*

In addition, trading the items with other users was frequently mentioned, yet not as often as the four reasons presented in Table 32. To sum up, the enjoyment aspect was also an important driver of purchasing activity; by purchasing the users aim to boost their overall user experience i.e. gain something extra

compared to basic users. This extra can relate to increased entertainment, gaining and exhibiting a higher status and prestige among the users, or a having a wider range of opportunities with which to express their personality regarding appearance or the decorating of their virtual room.

This chapter presented the results of the data analysis. After testing the hypothesised relationship, a test of the moderating effects was conducted and a revised model including only the significant relationships was presented. Finally, the results were further validated both quantitatively and qualitatively. The next chapter reflects on the findings of the research in the light of prior literature on the subjects.

8 DISCUSSING THE FINDINGS

The aim of the chapter is to relate the result obtained from this study to the prior literature. The outcome of each research hypothesis is discussed in relation to the findings from relevant previous research. Thus, the focus of the chapter is to reflect on the findings and the following chapter will discuss the theoretical and managerial implications as well as future research possibilities and limitations.

8.1 Predictors of the continuous use intention

In the research model the continuous use of an SVW was hypothesised to be determined by motivational, social, interface-related and facilitating factors. The explanatory power of the continuous use intention of almost 60 % is comparable with or is above prior studies that have examined continuous IS use (Bhattacherjee, 2001b; Hong et al., 2006a; Kang et al., 2009; Kang & Lee, 2010; Larsen et al., 2009; Limayem et al., 2007; Thong et al., 2006). Furthermore, in comparison to prior research examining the adoption of hedonic-oriented IS, the results exhibit a substantial degree of predictive validity (Hong & Tam, 2006; Li et al., 2010; Lin & Bhattacherjee, 2008; Lin & Bhattacherjee, 2010; Turel et al., 2010). Generally, the result confirmed the existence and viability of these factors in predicting SVW use.

However, the fact that the second variables in the motivational, social and facilitating blocks, namely perceived usefulness, subjective norm and availability were not found to have a significant effect indicates that a more parsimonious model could be developed. As user behaviour in virtual worlds is a somewhat novel area of research, this study focused on comprehensiveness rather than explanatory power. Compared to prior research examining the adoption of virtual worlds largely from the motivational perspective (Shin, 2009), or applying TAM (Fetscherin & Lattemann, 2008; Hua & Haughton, 2009; Shen & Eder, 2009a) by developing a more extensive nomological net, the present research substantiates the understanding of the factors that drive post-adoption user behaviour in virtual worlds.

H1: Perceived enjoyment positively affects the continuous use intention. ***Supported***

H2: Perceived usefulness positively affects the continuous use intention. ***Not supported.***

Based on the result, continuous SVW use appears to be strongly intrinsically motivated. This is in line with e.g. Jung and Kang (2010) and Zhao et al. (forthcoming) who regard intrinsic motivation as a central goal in SVW use, especially for younger generations. It was interesting that of all the motivational factors intrinsic motivation was found to be the main predictor of the continuous use intention, and that the effect of extrinsic motivation was not significant. This finding contrasts with e.g. Shin (2009) who found extrinsic and intrinsic motivation to be almost equal predictors of the VW use intention. On the other hand the results are congruent with e.g. prior research on the adoption of hedonic and multipurpose IS, such as mobile data services, social networking sites and blogs where the effect of extrinsic motivation has been found to be found weaker than the intrinsic motivation (Hong & Tam, 2006; Sledgianowski & Kulviwat, 2009). Since SVWs are generally used for entertainment and leisure, the potential utility derived from the usage relates to these purposes.

From an empirical perspective this also explains the high correlation between the motivational factors, which has also been reported by Hua & Haughton (2009) in their study of VW adoption. As both were hypothesised to predict the continuous use intention, a high correlation between the constructs means that they partly share the explained variance for the continuous use intention. Another explanation for the high correlation between intrinsic and extrinsic motivation can be that a causal relationship between the motivations exists. In fact, a post-hoc analysis revealed a significant causal relationship from extrinsic to intrinsic motivation. Even though the direct influence of extrinsic motivation was found to be insignificant, the role of extrinsic motivation should not be neglected.

H3: Perceived network size positively affects the continuous use intention. ***Supported.***

H4: Subjective norm positively affects the continuous use intention. ***Not supported.***

The significant influence of perceived network size highlights the importance of the presence of other users in the SVW. In this regard, the results are in line with prior research on social networking sites (Sledgianowski & Kulviwat, 2009) and instant messaging (Li et al., 2010; Lin & Bhattacherjee, 2008). This finding builds upon a number of prior studies underscoring the salience of the presence of other relevant people in predicting technology acceptance or adoption (Compeau et al., 2007; Li et al., 2005; Van Slyke, 2007) with regard to

continuous use. Similarly, the presence of other users was found to be a predictor of purchasing behaviour. Taken together, the findings suggest that network effects play a role in the SVW setting.

The non-significant effect of subjective norms, on the other hand, may indicate that the normative influence is not particularly salient in predicting SVW use. This is in line with e.g. Karahanna et al. (1999) and Venkatesh et al. (2003) who found subjective norms to have a stronger influence among users with limited experience of a system. Another potential contributor to the non-significant influence of subjective norms may be the fact that revealing one's real identity is forbidden inside Habbo. However, the normative influence can also exist between virtual identities, and although the users have alternative means to find out who the person behind the avatar is, anonymity inside the virtual world can reduce the salience of normative influence. In their study on online video games Lin and Bhattacherjee (2010) examined social image i.e. status and reputation gained from using the system. This dimension of social influence could prove to provide more insight and perhaps be more relevant than subjective norms in the SVW setting.

H5: Perceived ease of use positively affects the continuous use intention. ***Supported.***

H6: Perceived social presence positively affects the continuous use intention. ***Supported.***

The fact that perceived ease of use was found to be a significant predictor of continuous SVW use is interesting since PEOU has been found to decrease in importance as users gain experience with the system (Premkumar & Bhattacherjee, 2008; Venkatesh et al., 2003). Furthermore, in their study on instant messaging Lin and Bhattacherjee (2008) argued that PEOU is not a very meaningful construct anymore since knowing how to use computers and the Internet is generally not a problem as today's users are more familiar with ICT. On the other hand, studies on the adoption of hedonic (van der Heijden, 2004) and multipurpose (Hong & Tam, 2006) IS have found PEOU to be a significant and an even more powerful determinant of use intention, than e.g. perceived usefulness. Using Habbo as an example, the constant flow of new features and activities as well as using avatars to navigate the 3D environment means that the user needs to keep his or her skills up to date. In sum, the results indicate that PEOU is a meaningful and important construct in the SVW setting.

Perceived social presence was found to be a relevant determinant of the continuous use intention suggesting that a feeling of human warmth and human contact inside the SVW is important for the users. Since the target audience of

Habbo is teens, special attention has been paid to creating a friendly and safe environment for the young users, i.e. suspending the user accounts of those who break the code of conduct and applying a special filter that removes bad language from discussions. The relatively strong correlation between intrinsic motivation and social presence can be interpreted by the fact that social presence is a component of a friendly and warm user experience which, in turn, is perceived as enjoyable by the users. As argued by Lombard and Ditton (1997), perceived social presence has a profound impact on enjoyment and delight. Hassanein & Head (2007) found perceived social presence to be a predictor of both perceived usefulness and enjoyment in the online shopping context. Given the fact that there has only been limited research on the role and facets of social presence in virtual worlds, the findings encourage further investigation.

H7: SVW-specific self-efficacy positively affects the continuous use intention. ***Supported.***

The present study provides new information on the role of self-efficacy in the SVW setting. Shin (2009) found that self-efficacy predicted both extrinsic and intrinsic motivation for virtual world usage but did not investigate its effect on the behaviour. The results of this study demonstrate that self-efficacy is a relatively strong predictor of continuous SVW use. In this study, self-efficacy was examined specifically with regard to the use of Habbo. This is in accordance with prior research that has found that software-specific and application-specific factors predict the use intention (Agarwal & Karahanna, 2000; Hsu & Chiu, 2004; Yi & Hwang, 2003). This finding is particularly interesting since Habbo users can be referred to as digital natives (see Palfrey & Gasser, 2008), i.e. are generally very familiar with Internet and information technology. Yet the navigational mechanism can be relatively easily adopted by users, the variety of games and events as well as social interaction means actual SVW use can encompass a number of different activities that need to be learned.

H8: Availability negatively affects the continuous use intention. ***Not supported.***

The results clearly demonstrate that availability is not a major obstacle in using Habbo for the respondents. The users have relatively good access to Habbo and the parents seem not to prohibit its use. In fact, an interesting area to be further clarified would be to measure to what extent parents are actually aware of their children's online behaviour. Altogether, the technical equipment and infrastructure seems to be in place. As using Habbo is free and revenue is collected from selling virtual items and premium memberships, financial

resources are likely to affect purchase behaviour in those cases where real money is needed. In their study on the continuous use of interactive TV, Hsieh et al. (2008) found availability to be significant for socially disadvantaged users but not for the advantaged. Similarly, it is plausible to assume that socio-economic status has an effect, particularly on the purchase behaviour in Habbo.

Testing the moderating effects indicated that among the male users, the continuous use intention is more strongly driven by intrinsic motivation i.e. perceived enjoyment than it is amongst females. Furthermore, experience and age were found to amplify the positive effect of self-efficacy on the continuous use intention.

8.2 Predictors of the purchase intention

The three last hypotheses focus on the antecedents of the purchase intention. In the research model the purchase intention was viewed as a function of the continuous use intention, perceived network size and social presence. The results of the respective hypotheses are discussed in the following.

H9: Continuous use intention positively affects purchase intention. ***Supported.***

Overall, the results clearly confirm that the continuous use intention has a key mediating role to play between the factors driving continuous SVW use and the purchase intention. In total, slightly less than 50 % of the purchase intention was predicted by the continuous use intention, perceived network size and perceived social presence. However, continuous engagement alone accounted for more than 40 % of the variance in the purchase intention. This finding empirically highlights the importance of retaining existing customers in online services targeted towards individual customers (see e.g. Kim & Son, 2009; Premkumar & Bhattacherjee, 2008). As only a limited number of prior studies have empirically scrutinised the relationships between different post-adoption behaviours, the literature offers few points of reference with which to compare the findings. In the virtual community context, the intention to get information was found to be the strongest antecedent of the purchase intention, which together with trust yielded an explanatory power of around 30 percent (Lu et al., 2010). Moreover, in their study Venkatesh and Agarwal (2006) found usage behaviour to be the primary determinant of purchasing behaviour.

H10: Perceived network size positively affects the purchase intention. ***Supported.***

Continuous use is likely to lead to an increasing social circle inside the virtual world since social interaction has a central role in the SVW user experience. The results demonstrate a positive relationship between perceived network size and the purchase intention. This can be explained by the fact that the value of virtual possessions and the signalling of status increases when the number of people, especially those with whom one wants to interact, increases. The fact that PNS is a predictor of purchase intention demonstrates that network effects may influence the demand for virtual items. Since the prior research on the role of social influence in purchasing virtual items and services is very sparse, the literature offers few specific points of reference that reflect the results.

H11: Perceived social presence positively affects the purchase intention. ***Not Supported.***

Social presence had only a marginal effect on the purchase intention. This is in contrast to prior research in the online shopping context (Cyr et al., 2007). The difference can potentially be explained by the fact that purchasing is not the primary activity in virtual worlds but more an outcome of a process starting from usage that has continued over time. When making purchases inside the SVW, the users generally have prior experience of operating inside the virtual environment and are familiar with the user interface. Hence, the purchasing behaviour in the SVW setting appears to be influenced by other factors than social presence.

Testing the moderating effects revealed that the causal relationship from the continuous use intention to the purchase intention is stronger among male respondents. However, perceived network size appears to have a stronger influence on the purchase intention among the female respondents. Additionally, having premium membership amplifies the relationship from perceived network size to the intention to purchase. This can be explained by the fact that one of the benefits of premium membership is the option to have more users listed as friends in one's social circle. Therefore, the premium members are likely to have more friends in the SVW than regular users are, leading to a higher perceived network size and a higher willingness to invest money in maintaining the social circle within the SVW. Finally, as the relationship between continuous use intention and purchasing was found to be positively influenced by the length of experience, retaining active existing users remains the most viable strategy for encouraging spending in virtual environments.

8.3 Key findings

Based on the results of the testing of the hypotheses as well as the results obtained from analysing the moderating effects, six key findings are addressed. The first key finding relates to the characteristics of the SVW user interface and teens as users of IT. Given that the respondents can be labeled as digital natives they are expected to be very savvy with using various forms of IT. From this perspective the fact that self-efficacy and perceived ease of use were such strong determinants of continuous use is somewhat surprising. This finding indicates that usability and supporting users' self-efficacy remains a viable managerial issue for virtual world providers and among digital natives and demonstrates that in avatar-based navigation the quality of the user interface has a direct effect on user engagement with the service. However, although self-efficacy (see e.g. Shin, 2009; Shen, 2009b) and perceived ease of use (Hua & Haughton, 2008) have been employed in empirical investigation, relatively little prior research (Fetscherin & Latteman, 2008) on user behaviour in VWs has examined them as direct determinants of user engagement or reported them as an effect of the magnitude discovered here. Furthermore, the findings of this study are in line with Zhou et al. (2011) who employed uses and gratifications theory and found SVW participation to be influenced by hedonic, utilitarian and social factors.

Second, the results of the analysis demonstrated, as verified by the qualitative data, that, of the factors examined, teens' SVW usage is best predicted by enjoyment and by the perception of the presence of friends and other relevant people. In other words, the SVW is used in teen terminology 'because it's fun' and 'everyone else is there'. The fact that perceived enjoyment and usefulness were highly correlated indicates that from the users' perspective the two rather complement one another than represent a clear-cut dichotomy. Altogether this is in line with the findings of Zhou et al. (2011) who employed the uses and gratifications theory in order to examine the motives for SVW participation. Moreover, the findings demonstrate the convergence (Griffths & Light, 2008) of information technology. For instance, Habbo is used for socialising, gaming and self-expression, which has led to the motives for usage being transferred from the hedonic-utilitarian dichotomy towards an inextricable set of hedonic, utilitarian and social drivers of usage.

Third, Habbo is more successful in entertaining the male audience. Perceived enjoyment was a stronger predictor of continuous use among male respondents. Given that the majority of the respondents were female, and that perceived enjoyment was found to be the main driver of continuous usage, the fact that the entertainment value of Habbo does not equally translate into usage among females is a relevant issue for managers.

Fourth, the social influence of the SVW context is based on the perceived presence of other users having certain analogies to the visibility construct of innovation diffusion theory rather than the normative influence as operationalised in e.g. TRA. Compared to many forms of traditional IT where normative pressure has been found to be the primary source of social influence (see e.g. Venkatesh & Davis, 2000), the sources of social influence in the SVW setting are different and the normative pressure from outside the SVW was found to be insignificant in predicting usage.

Fifth, the results confirmed that purchasing comes after the usage step in the development of the customer relationship and that virtual purchasing is a way of improving user experience inside the virtual world. In other words, rather than bringing something entirely new into the user experience, it makes the existing elements better.

Sixth, somewhat surprisingly, having a premium membership was not found to reinforce the relationship between continuous use and purchasing. To examine this issue further, the scores given for the continuous use intention were compared those respondents who held a premium membership, those who had held it before and those who had never had premium membership. The analysis demonstrated that the scores for the continuous use intention and the purchase intentions were highest among current membership holders and lowest among those who had never had the premium membership.

9 CONCLUSIONS

The final chapter elaborates on the theoretical contribution of the research. In this chapter the research gaps and research questions are revisited and explicit answers to the research questions are presented. Thereafter, the managerial and societal implications are discussed and the limitations of the study are presented. The chapter concludes by suggesting avenues for further research.

9.1 Theoretical implications

The area of research to which this study contributes can be referred to as online consumer behaviour. Within this area the contextual domain of the study is social virtual worlds, and the behaviours of interest are the continuous use of SWVs and the purchasing of virtual items and services.

Within this area, four gaps in the prior literature were identified. Table 34 presents the research gaps and the implications for research.

Table 34 Research gaps and implications for research

Research gap	***Contribution***
1. Understanding the drivers of continuous user engagement and purchasing behaviour, especially together, in virtual worlds.	Enjoyment and perceived network size are the main drivers of continuous SVW use. Subjective norm is insignificant. Teens participate in SVW because of what they can experience and gain inside the virtual world, not because of factors extrinsic to the SVW. Continuous use and purchasing related, yet different aspects of post-adoption behaviour.
2. The conversion process from users to customers in the context of online services.	Nomological net and research model that can be used and applied in future research. Avatars-based navigation becoming increasingly pervasive, perceived ease of use remains a focal construct. In platforms where other users are virtually visibly present, the social influence occurs through the presence of other users, rather than through the normative influence.
3. VWs targeted at teens and IS research on teens as the users of information technology.	Perceived ease of use and self-efficacy are valid constructs also among digital natives. Perceived enjoyment is a critical determinant of usage.
4. The role of utilitarian, hedonic and social drivers of continuous user engagement in online services for hedonic and social purposes.	Virtual purchasing is a way to reinforce the specific value the SVW delivers the individual. Premium membership does not reinforce the relationship from usage to purchasing; however, premium members appear to be the most committed ones.

Although prior VW research has examined both user adoption and purchasing behaviour, studies empirically examining these two behaviours together have been rare. Therefore, with regard to the first research gap this research has extended the understanding of consumer behaviour in VW settings by examining a set of factors contributing to continuous SVW engagement, but also provided a preliminary understanding of the process from service usage to purchasing.

As regards the second gap, the present study contributes to both the independent and dependent variables in technology adoption research (see Benbasat & Barki, 2007). Regarding the contribution to independent variables, the study developed and tested a nomological net and a research model that provides a basic understanding of the influential contributors to continuous SVW engagement. Regarding dependent variables, the study investigated two

important post-adoption behaviours, continuous use and purchasing and the relationship between the two. As a result, this research provides a tool that can be verified, adapted and modified by other researchers.

The findings clearly address the role of intrinsic motivation, i.e. the enjoyment and pleasure derived from the usage in predicting continuous SVW engagement, yet the qualitative analysis also revealed a number of instrumental reasons for SVW participation. Given the demographic background and the use context, the salience of intrinsic motivation is not particularly surprising. Thus, a natural subsequent question would be: what constitutes perceived enjoyment? However, the fact that perceived enjoyment was found to be a strong predictor of continuous SVW use raises more questions. Two potential starting points for this investigation are perceived usefulness and social presence, which were both found to correlate with perceived enjoyment. Positioning perceived usefulness as an antecedent of perceived enjoyment would be congruent with cognitive evaluation theory (CET) that posits extrinsic motivation as a determinant of intrinsic motivation (Deci & Ryan, 1980). Social presence, when placed as a predictor of perceived enjoyment, could be grounded on the assumption that human warmth and sociability potentially reinforce the intrinsic motivation to participate in the SVW.

The fact that two types of motivation were empirically strongly correlated suggests users view enjoyment and utility as inextricable rather than as distinct components of the overall SVW experience. Shin (2009b) proposed that intrinsic motivation in an online social network context would be related to interaction with existing friends whereas extrinsic motivation would be more focused on exploring and seeking out new relationships. Taken together, further research is needed to truly understand what is perceived fun and what is useful in the context of cyberspace.

Information systems are becoming increasingly visual, for example, avatars and 3D graphics are being introduced as navigational tools with mobile devices[11]. With this in mind, the findings suggest that PEOU remains a focal construct in explaining technology adoption despite the pervasiveness of information technology and the increased competence of users. To better understand the determinants of PEOU in a context including avatars and 3D graphics, further research attempting to open this 'black box' would be beneficial, and not only for VW research but also from a wider IS perspective.

---

11 Nokia & Intel focus on 3D and virtual reality for mobile devices

http://www.computerworld.com/s/article/9181508/Nokia_Intel_focus_on_3D_and_virtual_reality_for_mobile_devices

(retrieved 27 Aug 2010)

This research contributes to the theoretical discussion on the role of social influence in technology adoption by empirically examining two facets of social influence, perceived network size and subjective norms. This research suggests that perceived network size could be, to a certain extent, viewed as analogous to the informational influence that Deutsch & Gerard (1955, 629) defined as "*influence to accept information from another as evidence about reality*". The perception of the amount of users in one's personal network can thus be viewed as evidence of the 'objective' reality of the diffusion of the technology, whereas the subjective norm construct captures the normative dimension of social influence. In the context of this study, informational influence was found to be the only source of social influence. In contrast to social networking sites, such as Facebook, where social interaction normally takes place among acquaintances, in SVWs users can interact with either people familiar from the offline world as well as with friends from virtual life. Furthermore, the users can start ad hoc discussions and interact with other users present in the virtual world at the same time. In sum, the findings provide new information on the role of social influence in online social networking.

As regards the third research gap and the contribution to research on virtual worlds, this study has followed the suggestion by Spence (2008) of widening the contextual scope of the research from Second Life to SVWs targeted at people under the age of 20.

The study examined teenagers as users of IT which can be viewed as an extension of the contextual scope of IS research. Despite the fact that the respondents have been exposed to information technology from their childhood and fall into the digital natives group, self-efficacy and perceived ease of use still play a role in predicting their SVW participation. Given that digital natives are expected to use various forms of IT intuitively, this finding was interesting. In the SVW context it can be interpreted in the following way; although users can use systems more complicated than SVWs, to be enjoyable and sustain their attraction, the use of an SVW should be free of mental effort.

With regard to the fourth research gap, the findings provide new information about two key behavioural manifestations of customer loyalty, the continuous use intention and the purchase intention, and the relationship between the two in the SVW setting. In marketing literature, purchasing behaviour has traditionally been viewed as a consequence of favourable attitudes or satisfaction. Without questioning this assertion, the revenue model applied could be taken into account to be able to better understand the factors and process leading to purchasing. For example the *freemium* revenue model, where the user is given an opportunity to use the service for free and revenue is generated by selling value-added services or upgrades to the existing customer base, is widely used in services such as Skype, Spotify and Habbo. In this scenario the intention to continue using the

service is a prerequisite for the purchase behaviour to take place and should hence be examined in its own right. Taken together, the findings provide empirical insight into the conversion of individuals from users to customers that can be of value for online services providing social interaction and entertainment services. However, it is important to keep in mind that generalising the results obtained from a single service to other contexts is not advisable. Rather, the findings of the study can only offer general insight outside the study's boundaries. In addition, this study has expanded the field of online consumer behaviour to virtual worlds, and examined teens as customers.

Based on the gaps identified in the prior literature, two research questions were postulated:

RQ1: What factors drive teens' continuous engagement in social virtual worlds?

RQ2: What factors drive teens' purchasing of virtual items and value-added services?

To answer the first question, based on a review of prior literature and the scrutiny of the use context of Habbo, four factors, each consisting of two constructs, were distilled from the literature and found to be the most important predictors of continuous SVW engagement. Hence, this study asserts that continuous SVW use is predicted by motivational, social, interface and facilitating factors. The existence of these four factors was empirically verified when testing the model. Empirical testing proved and verified that the presented model is superior to TAM, TPB and UTAUT in explaining the continuous use intention in the SVW context. Taken together, an explicit answer to the first research question can be put forward as follows:

Teens' SVW use is driven by factors intrinsic to the platform rather than instrumental gains outside the virtual world or external normative pressure. In practice, teens use SVWs because of the enjoyment and pleasure derived from being involved in the SVW together with other users. The enjoyment is co-created by the platform itself and the users. To facilitate the pleasurable user experience and sustain user attraction, a frequent flow of new activities and features is needed. The dynamic use context makes perceived ease of use and self-efficacy important drivers of sustained user engagement.

As regards the second research question, the study provides empirical evidence that purchasing behaviour is positively influenced by continuous use and perceived network size. Yet continuous use was found to exert the largest influence on the purchase intention, the findings clearly indicate that the continuous use intention does not automatically transfer into purchasing. The qualitative responses demonstrate that users enhance the key aspects of the SVW experience via virtual purchasing. Taken together, the answer to the second research question is postulated as follows:

Virtual items and value-added services are purchased to enhance the user experience inside the virtual world. The enhancement may be derived from increased entertainment value, social value from gains in status, or self-expressive value gained by decorating one's avatar or private virtual space. In sum, the factors that drive continuous SVW usage are also important drivers of the purchase intention.

9.2 Implications for business

The business implications of the study are closely related to the SVW and VW context. Moreover, the findings may also offer certain insight into other areas of social computing. However, as Habbo is an SVW targeted specifically towards young people, drawing generalisations to other services and applications is not advisable. The implications are targeted towards VW operators and marketers interested in virtual worlds. The implications for virtual world operators focus on two areas, namely promoting virtual spending and how to manage customer relationships in a virtual environment.

In a large number of today's online businesses in the consumer market, a variety of revenue models are based on distributing the basic product or service to a large audience and monetising the customer base, for example by converting the users into paying customers. Consequently, the conversion process is a key managerial challenge and a sine qua non for long-term business success. From this perspective, three implications related to promoting virtual purchasing are put forward.

First, as the income from micro-transactions, in other words selling virtual items and value-added services to the users, is an important part of the revenue model of many online services, the operators should pay attention to reinforcing the feeling of the presence of other users to encourage virtual purchasing. In practice, features informing users about how many users and how many friends are online may motivate people to purchase virtual items and services.

Second, actively developing mechanisms to reinforce the link between continuous use and purchasing is advisable. The results demonstrate that purchasing is predicted by the continuous use intention, but most of the variance was explained by other factors. Additionally, if a user had a premium membership it did not reinforce the link from continuous use to purchasing. Hence, the operators should not rely on the hope that continuous use will automatically lead to increased purchasing, or that once started virtual purchasing will continue.

Third, keeping in mind the challenges in generating revenue directly from users, complementing the streams of revenue with other sources, such as advertising and market research can help to reduce fluctuations in the cash flow.

As regards the second area of business implications, managing customer relationships in a virtual environment, five main issues are addressed.

First, in businesses where the customer bases are very large and personal interaction with every customer is impossible, customer relationship management (CRM) is a largely applied solution. Instead of using the service as it is provided and remaining passive subjects of marketing activities, the SVW users are, in fact, active co-creators of the service, forming their own networks within the service. In consequence, rather than engineering the most highly targeted set of marketing activities according to best CRM practices, a more meaningful approach would be to extend thinking outside the boundaries of CRM.

For example, developing mechanisms and strategies for *customer involvement management* and *value co-creation* (Bernoff & Li, 2008; Füller, 2010), i.e. empowering the customer to maximise the value created from the SVW. As the qualitative reasons for virtual purchasing demonstrate, users purchase virtual items and services to gain more from their SVW use i.e. to extract more value from their SVW experience.

In practice, this could be done by encouraging the users to organise small-scale events by themselves, while providing the tools for this. To increase virtual purchasing, instead of the current product-centered grouping of virtual items, such as clothes, accessories and furniture, the offering could be tailored using value-based segmentation and user preferences.

Second, because rewarding loyal customers is a common part of the CRM toolkit, specific rewarding mechanisms for the SVW context could be developed. Currently, to retain active users, Habbo rewards its loyal customers with special credits that can be used to purchase virtual possessions. Rewarding loyal customers could also be done by giving public recognition and prestige. This could happen by organising special events, for example Academy Awards type of galas, where awards would be handed to a small group of users by celebrities visiting the SVW. In addition, in order to further promote virtual spending, users could be rewarded with discounted Habbo credits, or receive exclusive credits available only for the best customers.

Third, developers of the services should remain cognizant of the fact that to be entertaining, using an SVW should not require a considerable amount of mental effort. Thus maintaining a delicate balance between a constant flow of new features and activities and the ease with which an interface can be used is an important issue. The new features should be implemented in a way that they does not radically change the navigational logic and frustrate users but offers the pleasure of discovering something new.

Fourth, social interaction in SVWs is based, not only on hanging out with existing friends known from either the 'real' or virtual world, but also on fast-paced interaction with previously unknown individuals that happen to be online simultaneously. Therefore, it is important to facilitate and perhaps develop new features for making new contacts.

Fifth, this study has largely revolved around the continuous use intention, however, it is worth remembering that nothing lasts forever – teens' interests being a rather good example. At some point the SVW will lose its attractiveness and an individual's usage will come to an end. As reported by Iqbal et al. (2010), as the users grow up they start perceiving VWs targeted at a young audience as too childish. From this perspective it would highly advisable to extend customer lifecycle thinking beyond the scope of a single service but aim at building a business consisting of a range of services for different audiences. A concrete step in this direction from Sulake Corporation has been to establish Bobba Bar, an SVW application for smartphones that is targeted at the adult audience. In contrast to Habbo, Bobba Bar does not include the filter that moderates inappropriate language from discussions. To develop the ecosystem thinking further, enabling users to transfer from one platform to another, utilising similar characteristics in a user interface to facilitate a smooth transfer from one service to another and making the credits exchangeable between the platforms could potentially help to extend the lifecycle of the customer relationships. From a CRM perspective this calls for mechanisms identifying the critical points in the customer relationship lifecycle in order to facilitate the smooth transfer.

From a marketing perspective, companies have become increasingly interested in how to best take advantage of the various forms of social media, including virtual worlds (Hemp, 2008). SVW offers marketers a variety of opportunities to engage with their current and potential customers. Establishing a commercial space in e.g. Habbo provides a company with opportunities to promote the product but also allows it to follow people's reactions and comments.

When designing marketing activities inside virtual worlds the marketers should play close attention to understanding user behaviour and utilising the interactive nature of SVWs. Similarly with any marketing events in the offline world, the virtual events should be designed in a way that they attract people and create buzz.

A virtual 'ghost room' without any visitors is a wasted opportunity. Therefore, marketers should carefully consider how to create a meaningful 'catch' to motive participation and ideally make people want to spend time in the commercial premises. Games, events with opportunities to see and meet celebrities and incentives are likely to create attraction and spread word about a place worth visiting.

9.3 Societal implications

As virtual consumption is an increasing phenomenon among the younger generations, it also has relevance from a societal perspective. This study has examined two facets of consumption, namely time and money. In general, the operators of social media for online social networking services have been more successful in attracting the consumption of time rather than money.

Based on the findings of this study, it can be expected that the increased consumption of time in virtual worlds will also increase the amount of money spent on virtual goods and services. The results suggest that, similarly to numerous other goods and services, teens use social virtual worlds primarily because of their hedonic value. Thus, in broad terms, SVWs can be viewed as competitors of, or complements to, hobbies, movies, games, sports, homework, but perhaps also of some less desirable forms of spending free time. Although this study does not provide definitive answers, this study suggests policymakers should consider what forms and extent of virtual consumption are desirable from a societal perspective.

Keeping in mind that spending money on virtual goods and services is an increasing form of consumption, educating younger generations on how to manage their personal finances in virtual environments may be a relevant skill for citizens. On the other hand, social virtual worlds can potentially provide an applicable platform for educating youths about the basics of managing one's personal finances, but also help to develop basic knowledge about economics, such as increase in demand for a rare product results in an increase in price.

To sum up, SVWs are relatively safe environments in which to practice interaction with other individuals while also acting as a consumer. This however requires that the virtual environments have implemented an appropriate code of conduct for the users that is rigorously monitored and that a sufficient level of regulation and legislation is in place.

Various virtual platforms are becoming increasingly pervasive in people's social interaction, free time and work, and, as a result, so are governmental organisations, for instance the Finnish police force has established a presence on Facebook. The subsequent step in this process is that the Finnish Ministry of the Interior is now considering establishing a virtual platform where citizens could e.g. interact with governmental officials in a virtual space and search for information.[12]

12 Ferm, Tiina "Ministry of the Interior virtually present" (in Finnish "Virtuaalisesti läsnäoleva sisäasiainministeriö") , presentation at the JulkIT seminar, Helsinki, 11 June 2010.

When developing these initiatives, government officials and policymakers should remain cognizant of the fact that to be equally available to a large number of citizens, a governmental 3D virtual platform cannot be designed only for the tech-savvy digital native generation. For example, the user interface and navigational mechanism of Second Life require considerable learning effort on behalf of the user, creating a certain barrier for becoming pervasive throughout the innovation diffusion curve (Rogers, 2003). In addition to the cognitive skills and motivation of the users, highly-sophisticated 3D virtual environments require substantial computing capacity and a fast connection to run smoothly. To be accessible to all citizens, governmental platforms should make very few demands of a computer and also be accessible with the mobile devices that are widely used to access the Internet. For many services traditional user interfaces and navigation are more user-friendly and efficient.

To sum up, rather than being a revolution, *v-government* can be a stage in the evolution of e-government that can facilitate bringing a government closer to its citizens.

9.4 Limitations

This research possesses limitations that need to be addressed. On the other hand, many of the limitations can also be viewed as areas for further study. The first issue to be addressed relates to the generalisability of the findings. As the empirical data was collected from only Finnish Habbo users using voluntary sampling, drawing statistically generalisable conclusions to other SVWs and cultural contexts is not possible. Given that this study is an early attempt to uncover a new research area, exploration is more likely to be a more realistic aim than statistical generalisability. In this regard, further studies can substantiate the current research by deliberately aiming at more generisable results.

Second, self-reported measures were used as the empirical data for the study but, although extensively utilised in IS research, the potential biases related to issues such as the social desirability of self-reported measures, compared to 'objective' information about the actual behaviour, need to be acknowledged.

Third, the data collection was cross-sectional. However, a longitudinal dataset could possibly enable a more reliable and thorough description of the process aspects of SVW use. More accurate information about the relationship between use and purchasing, and the timeframes needed to convert the user into a customer is needed. On the other hand, since most of the measures used in this study can be labelled as beliefs, identifying a change that could have happened between two points in time is less relevant, if the actual reasons for the change

cannot be captured. Even with the most sophisticated survey instrument this would remain an insurmountable challenge.

In an ideal world, all the addressed limitations would have been overcome in the research design stage of the process. However, in practice, there were not many alternatives to the chosen data collection procedure. Thus, fundamentally, a trade-off between the limitations and the gaining of access to the data was inevitable. As a result, the opportunity cost of the limitation would have been that the research would had have materialised in the first place.

In addition to the limitations related to the research design, the second set of limitations relates to the underlying assumptions of the theoretical frameworks used to build the research model. The nomological net of the research posits that beliefs predict attitudes and behavioural intention, and that behaviour is fundamentally intentional. Thus, the research model is based on the assumption that reasoning, given that the rationality is likely to be bounded, determines behaviour. Without questioning this tenet, it must be noted that factors outside reasoning, such as habits and addictions, have been found to influence human behaviour. Yet articulated here, this limitation is not specific to the current study, but it is common to the large amount of literature concentrating on technology adoption.

9.5 Further Research

The findings provide several potential avenues for further research. First, based on the 50 % level of variance explained for the purchase intention, purchase behaviour in VW settings would seem to be relatively strongly predicted by the continuous use intention. Therefore, further research that more closely examines the conversion from users to customers (Venkatesh & Agarwal, 2006) would be highly relevant. For example, a study that uncovers and examines the factors that influence the conversion process would be a potential area for further investigation. Additionally, since a substantial degree of the variance in the purchase intention was not explained by this study, further research should attempt to identify factors that are potential predictors of purchasing behaviour in their own right.

Second, as perceived enjoyment was found to be clearly the most powerful determinant of continuous SVW use, further research could examine the factors contributing to intrinsic motivation. As this study is the first attempt, further research could examine whether perceived usefulness and social presence could be positioned as antecedents of perceived enjoyment.

Third, a detailed investigation of the role of attitudes with regard to the behaviours uncovered in this study would also be a viable path for additional

research. In particular, research examining which beliefs result in positive or negative attitudes towards an SVW or the use of an SVW, and the actual outcomes of the attitudes would be appropriate. However, close attention should the paid to defining the target domain of the attitude. Related to attitudes, the role of satisfaction could be similarly examined. When examining attitudes and satisfaction, it should be noted that the target domain should be carefully specified according to the correspondence principle, since e.g. attitude *toward an object*, i.e. an SVW, is not synonymous to the attitude towards *using* an SVW, and respectively the attitude towards using an SVW is not applicable to predicting *purchasing* behaviour.

Fourth, this study has focused more on the cognitive evaluation of behaviour and thus, incorporating the effects of behavior within a future study would be a meaningful way of complementing this study. In addition to effects, other factors outside logical reasoning, such as habit, as well as the impulsive, addictive, compulsive and escapist reasons that contribute to SVW use could be examined (Limayem et al., 2007).

Fifth, the mechanisms behind social influence should be further investigated. This study has developed the preliminary understanding that informational influence is the main source of social influence. An essential area for further investigation would be to clarify what the mechanism behind social influence in online social networking and interaction is. In particular, it would be impotant to understand how compliance, identification and internalisation (see e.g. Venkatesh & Davis, 2000) actually take place in online social networking and interaction.

Sixth, as this study examined only Finnish Habbo users, a cross-cultural validation of the results would be interesting. Moreover, as national culture represents only one layer of culture (Karahanna et al., 2005), examining culture in a more holistic manner by incorporating both group and individual-level cultures into one investigation would be most intriguing. Furthermore, aspects related to the culture inside the VW could be used in understanding the usage and purchasing behaviour of the SVW participants.

Seventh, since continuous use is very much an ongoing phenomenon, and purchasing behaviour can be expected to follow it temporally, a longitudinal approach (Kim et al., 2009) would be a good way to grasp the evolving and dynamic nature of the phenomena of interest. This could also shed more light on the process of turning users into customers.

Eight, as virtual worlds are used for various purposes, the array of different reasons for usage is likely to be somewhat broad. In this research the motivational reasons were hypothesised to be related to enjoyment and social interaction with friends. To examine the extent to which this assertion holds true, a qualitative analysis was conducted. The analysis revealed the importance of

hedonic reasons and intrinsic motivation with responses such as "*Cuz (because) it's fun*" or "*it's so much fun*". Moreover, the qualitative analysis confirmed that social interaction with other people, especially with friends, was perceived as the primary utilitarian reason for Habbo engagement in general. The responses "*I meet my friends there"* or "*I chat with my homies (best friends)*" were among the most frequently mentioned reasons for Habbo use that can be considered utilitarian. Taken together, the constructs used to measure the motivational influence can be considered to have captured the two most essential reasons for SVW participation. Further research to uncover other reasons for SVW participation (Jung & Kang, 2010; Zhou et al., 2011) and subsequently perhaps measure their influence would substantiate the findings of the present study in a meaningful way.

Ninth, as the premium membership was examined as a moderator in this research, the focus was not on making comparisons between premium and regular members. Therefore, research deliberately focusing on the cross-group comparisons between users and customers could possibly provide further information on the differences between the two.

Tenth, cross-group comparisons could also be made by clustering the respondents based on their reasons for SVW participation and examining and testing the research model with each of the formed groups. This approach could potentially offer further managerially relevant information, as well as provide a basis for psychometric segmentation. From a theoretical standpoint this approach would substantiate the current understanding of the moderators used in technology adoption processes.

To sum up the entire research process, the author views scientific inquiry as an incremental process in which the role of one contribution is to incrementally increase our understanding of an issue. From this perspective, this study has answered some questions and raised several new ones. The author warmly welcomes further research that continues from where this study ends.

REFERENCES

Abrahamson, E. (1991) Managerial Fads and Fashions: The Diffusion and Rejection of Innovations. *The Academy of Management Review,* 16, 3, 586−612.

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

Agarwal, R. − 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. − Prasad, J. (1998) A Conceptual and Operational Definition of Personal Innovativeness in the Domain of Information Technology. *Information Systems Research,* 9, 2, 204.

Agarwal, R. − Prasad, J. (1997) The Role of Innovation Characteristics and Perceived Voluntariness in the Acceptance of Information Technologies. *Decision Sciences,* 28, 3, 557−582.

Agarwal, R. − Sambamurthy, V. − Stair, R. M. (2000) The Evolving Relationship between General and Specific Computer Self-Efficacy−an Empirical Assessment. *Information Systems Research,* 11, 4, 418−430.

Ahn, T. − Ryu, S. − Han, I. (2007) The Impact of Web Quality and Playfulness on User Acceptance of Online Retailing. *Information & Management,* 44, 3, 263−275.

Ahuja, M. K. − Thatcher, J. B. (2005) Moving Beyond Intentions and Toward the Theory of Trying: Effects of Work Environment and Gender on Post-Adoption Information Technology use. *MIS Quarterly,* 29, 3, 427−459.

Ajzen, I. (2005) Attitudes, Personality, and Behavior (2nd Ed.). Open University Press (McGraw-Hill): Milton-Keynes, England.

Ajzen, I. (1985) From Intentions to Actions: A Theory of Planned Behavior. In: *Springer series in social psychology* Ed. by Kuhlman, J. and Beckmann, J. Springer: Berlin, 11−39.

Ajzen, I. (1991) The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes,* 50, 2, 179−211.

Anderson, C. (2006) Long Tail: Why the Future Business is Selling Less of More. Hyperion: NY.

Anderson, J. C. − Gerbing, D. W. (1988) Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*, 103, 3, 411−423.

Anderson, R. E. − Srinivasan, S. S. (2003) E-Satisfaction and E-Loyalty: A Contingency Framework. *Psychology & Marketing*, 20, 2, 123−138.

Arakji, R. − Lang, K. (2008) Avatar Business Value Analysis: A Method for the Evaluation of Business Value Creation in Virtual Commerce. *Journal of Electronic Commerce Research*, 9, 3, 207−218.

Bagozzi, R. P. (2007) On the Meaning of Formative Measurement and how it Differs from Reflective Measurement: Comment on Howell, Breivik, and Wilcox (2007). *Psychological Methods*, 12, 2, 229−237.

Bagozzi, R. P. − Yi, Y. (1988) On the Evaluation of Structural Equation Models. *Journal of the Academy of Marketing Science*, 16, 1, 74−94.

Bainbridge, W. S. (2007) The Scientific Research Potential of Virtual Worlds. *Science*, 317, 5867, 472−476.

Bandura, A. (1982) Self-Efficacy Mechanism in Human Agency. *American Psychologist*, 37, 2, 122−147.

Bandura, A. (1997) Self-Efficacy: The Exercise of Control. Freeman: New York, NY.

Bandura, A. (1977) Self-Efficacy: Toward a Unifying Theory of Behavioural Change. *Psychological Review*, 84, 2, 191−215.

Bandura, A. (1986) Social Foundations of Thought and Action: A Social Cognitive Theory. Prentice Hall: Englewood Cliffs, NJ.

Barkhi, R. − Belanger, F. − Hicks, J. (2008) A Model of the Determinants of Purchasing from Virtual Stores. *Journal of Organizational Computing & Electronic Commerce*, 18, 3, 177−196.

Barnes, S. − Mattsson, J. (2008) Brand Value in Virtual Worlds: An Axiological Approach. *Journal of Electronic Commerce Research*, 9, 3, 195−206.

Bartle, R. A. (2003) Designing Virtual Words. New Riders: Indianapolis.

Behrend, T. S. − Wiebe, E. N. − London, J. E. − Johnson, E. C. (2010) Cloud Computing Adoption and Usage in Community Colleges. *Behaviour & Information Technology* (article available online).

Bélisle, J-F. − Onur Bodur, H (2010) Avatars as Information: Perception of Consumers Based on Their Avatars in Virtual Worlds. Psychology & Marketing, 25, 8, 741−765.

Bell, M. W. (2008) Toward a Definition of "virtual Worlds". *Journal of Virtual Worlds Research,* 1, 1, 1−5 .

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

Benbasat, I. − Zmud, R. W. (2003) The Identity Crisis within the IS Discipline: Defining and Communicating the Discipline's Core Properties. *MIS Quarterly,* 27, 2, 183−194.

Bente, G. − Rüggenberg, S. − Krämer, N. C. − Eschenburg, F. (2008) Avatar-Mediated Networking: Increasing Social Presence and Interpersonal Trust in Net-Based Collaborations. *Human Communication Research,* 34, 2, 287−318.

Bernoff, J. − Li, C. (2008) Harnessing the Power of the Oh-so-Social Web. *MIT Sloan Management Review,* 49, 3, 36−42.

Bhattacherjee, A. (2001a) An Empirical Analysis of the Antecedents of Electronic Commerce Service Continuance. *Decision Support Systems,* 32, 2, 201−214.

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

Boudreau, M. − Gefen, D. − Straub, D. W. (2001) Validation in Information Systems Research: A State-of-the-Art Assessment. *MIS Quarterly,* 25, 1, 1−16.

Bradford, M. − Florin, J. (2003) Examining the Role of Innovation Diffusion Factors on the Implementation Success of Enterprise Resource Planning Systems. *International Journal of Accounting Information Systems,* 4, 3, 205−225.

Brown, S. A. (2008) Household Technology Adoption, use, and Impacts: Past, Present, and Future. *Information Systems Frontiers,* 10, 4, 397−402.

Brown, S. A. − 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.

Burrell, G. − Morgan, G. (1979) Sociological Paradigms and Organisational Analysis: Elements of the Sociology of Corporate Life. Heinemann: London.

Byrne, B., M. (2001) Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming. Lawrence Erlbaum Associates: Mahwah, New Jersey.

Cagnina, M. − Poian, M. (2009) Beyond e-Business Models: The Road to Virtual Worlds. *Electronic Commerce Research,* 9, 1−2, 49−75.

Calder, B. J. − Staw, B. M. (1975) Self-Perception of Intrinsic and Extrinsic Motivation. *Journal of Personality and Social Psychology,* 31, 4, 599−605.

Carlsson, C. − Carlsson, J. − Hyvönen, K. − Puhakainen, J. − Walden, P. (2006) Adoption of Mobile Devices/Services – Searching for Answers with the UTAUT. *In proceedings of the 39th Hawaii International Conference on System Sciences (HICSS-39),* Kauai, USA, January 4−7, 2006.

Castronova, E. M. (2005) Synthetic Worlds: The Business Culture of Online Games. University of Chicago Press: USA.

Cha, J. (2009) Shopping on Social Networking Web Sites: Attitudes Toward Real Versus Virtual Items. *Journal of Interactive Advertising,* 10, 1, 77−93 .

Chan, S. − Lu, M. (2004) Understanding Internet Banking Adoption and use Behavior: A Hong Kong Perspective. *Journal of Global Information Management,* 12, 3, 21−43.

Chang, H. H. − Chen, S. W. (2008) The Impact of Customer Interface Quality, Satisfaction and Switching Costs on e-Loyalty: Internet Experience as a Moderator. *Computers in Human Behavior,* 24, 6, 2927−2944.

Chao-Min Chiu − Hua-Yang Lin − Szu-Yuan Sun − Meng-Hsiang Hsu. (2009) Understanding Customers' Loyalty Intentions Towards Online Shopping: An Integration of Technology Acceptance Model and Fairness Theory. *Behaviour & Information Technology,* 28, 4, 347−360.

Chea, S. − Luo, M. M. (2008) Post-Adoption Behaviors of E-Service Customers: The Interplay of Cognition and Emotion. *International Journal of Electronic Commerce,* 12, 3, 29−56.

Chen, L. − Gillenson, M. L. − Sherrell, D. L. (2002) Enticing Online Consumers: An Extended Technology Acceptance Perspective. *Information & Management,* 39, 8, 705−719.

Chen, W. − Hirschheim, R. (2004) A Paradigmatic and Methodological Examination of Information Systems Research from 1991 to 2001. *Information Systems Journal,* 14, 3, 197−235.

Chesney, T. − Coyne, I. − Logan, B. − Madden, N. (2009) Griefing in Virtual Worlds: Causes, Casualties and Coping Strategies. *Information Systems Journal*, 19, 6, 525−548.

Cheung, C. M. K. (2005) A Critical Review of Online Consumer Behavior: Empirical Research. *Journal of Electronic Commerce in Organizations*, 3, 4, 1−19.

Childers, T. L. − Rao, A., R. (1992) The Influence of Familiar and Peer-Based Reference Groups on Consumer Decisions. *Journal of Consumer Research*, 19, 2, 198−221.

Childers, T. L. − Carr, C. L. − Peckc, J. − Carson, S. (2001) Hedonic and Utilitarian Motivations for Online Retail Shopping Behavior. *Journal of Retailing*, 77, 4, 511−535.

Chin, W. W. (1998) Issues and Opinion on Structural Equation Modeling. *MIS Quarterly, 22, 1* 7−16.

Chin, W. W. − Todd, P. A. (1995) On the use, Usefulness, and Ease of use of Structural Equation Modeling in MIS Research: A Note of Caution. *MIS Quarterly*, 19, 2, 237−246.

Chiu, C. − Chang, C. − Cheng, H. − Fang, Y. (2009) Determinants of Customer Repurchase Intention in Online Shopping. *Online Information Review*, 33, 4, 761−784.

Chiu, C. − Hsu, M. − Wang, E. T. G. (2006) Understanding Knowledge Sharing in Virtual Communities: An Integration of Social Capital and Social Cognitive Theories. *Decision Support Systems*, 42, 3, 1872−1888.

Churchill, G. A. J. − Surprenant, C. (1982) An Investigation into the Determinants of Customer Satisfaction. *Journal of Marketing Research*, 19, 4, 491−504.

Close, A. G. − Kukar-Kinney, M. (2010) Beyond Buying: Motivations Behind Consumers' Online Shopping Cart use. *Journal of Business Research*, 63, 9−10, 986−992.

Collins, J. − Hussey, R. (2003) Business Research: A Practical Guide for Undergraduate and Postgraduate Students, 2nd Edition. Palgrave Macmillian: Basingstoke.

Compeau, D. R. − Higgins, C. A. (1995) Computer Self-Efficacy: Development of a Measure and Initial Test. *MIS Quarterly*, 19, 2, 189−211.

Compeau, D. R. − Meister, D. B. − Higgins, C. A. (2007) From Prediction to Explanation: Reconceptualizing and Extending the Perceived Characteristics of Innovating. *Journal of the Association for Information Systems,* 8, 8, 409−439.

Cooper, R. B. − Zmud, R. W. (1990) Information Technology Implementation Research: A Technological Diffusion Approach. *Management Science,* 36, 2, 123−139.

Cronbach, L. J. − Meehl, P. E. (1955) Construct Validity in Psychological Tests. *Psychological Bulletin,* 52, 4, 281−302.

Cyr, D. − Hassanein, K. − Head, M. − Ivanov, A. (2007) The Role of Social Presence in Establishing Loyalty in e-Service Environments. *Interacting with Computers,* 19, 1, 43−56.

Daft, R. L. − Lengel, R. H. (1986) Organizational Information Requirements, Media Richness and Structural Design. *Management Science,* 32, 5, Organization Design, 554−571.

Daft, R. L. − Lengel, R. H. − Trevino, L. K. (1987) Message Equivocality, Media Selection, and Manager Performance: Implications for Information Systems. *MIS Quarterly,* 11, 3, 355−366.

Dash, S. − Saji, K. B. (2007) The Role of Consumer Self-Efficacy and Website Social-Presence in Customers' Adoption of B2C Online Shopping: An Empirical Study in the Indian Context. *Journal of International Consumer Marketing; New York,* 20, 2, 33−48.

Davis, A. − Murphy, J. − Owens, D. − Khazanchi, D. − Zigurs, I. (2009) Avatars, People, and Virtual Worlds: Foundations for Research in Metaverses. *Journal of the Association for Information Systems,* 10, 2, 90−117.

Davis, F. D. (1989) Perceived Usefulness, Perceived Ease of use, and User Acceptance of Information Technology. *MIS Quarterly,* 13, 3, 319−340.

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

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

Deci, E., L. (1975) Intrinsic Motivation. Plenum Press: New York, NY.

Deci, E., L. − Ryan, R., M. (1980) The Empirical Exploration of Intrinsic Motivational Processes. In: *Advances in Experimental Social Psychology*. Ed. by Berkowitz, L. Academic Press: New York, NY, 39−80.

Deci, E. L. − Ryan, R. M. (2000) The 'what' and 'Why' of Goal Pursuits: Human Needs and the Self-Determination of Behavior. *Psychological Inquiry,* 11, 4, 227−268.

Deetz, S. (1996) Describing Differences in Approaches to Organization Science: Rethinking Burrell and Morgan and their Legacy. *Organization Science,* 7, 2, 191−207.

DeLone, W. H. − McLean, E. R. (1992) Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research,* 3, 1, 60−95.

Deutsch, M. − Gerard, H. B. (1955) A Study of Normative and Informational Social Influences upon Individual Judgment. *Journal of Abnormal and Social Psychology,* 51, 3, 629−636.

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

Dick, A. S. − Basu, K. (1994) Customer Loyalty: Toward an Integrated Conceptual Framework. *Journal of the Academy of Marketing Science,* 22, 2, 99−113.

Dickinger, A. − Arami, M. − Meyer, D. (2008) The Role of Perceived Enjoyment and Social Norm in the Adoption of Technology with Network Externalities. *European Journal of Information Systems,* 17, 1, 4−11.

Dillon, A. − Morris, M. G. (1996) User Acceptance of New Information Technology: Theories and Models. In: *Annual Review of Information Science and Technology.* Ed. by Williams, M. Information Today: Medford, NJ, 3−32.

Dinev, T. − Hart, P. (2006) An Extended Privacy Calculus Model for E-Commerce Transactions. *Information Systems Research,* 17, 1, 61−80.

Dishaw, M. T. − Strong, D. M. (1999) Extending the Technology Acceptance Model with task–technology Fit Constructs. *Information & Management,* 36, 1, 9−21.

Dougherty, C. − Lastowka, G. (2007) Virtual Trademarks. *The Santa Clara Computer and High Technology Law Journal,* 24, 4, 749−828.

Eschenbrenner, B. − Nah, F. − Siau, K. (2008) 3-D Virtual Worlds in Education: Applications, Benefits, Issues, and Opportunities. *Journal of Database Management*, 19, 4, 91−110.

Fang, K. − Lin, Y. − Chuang, T. (2009) Why do Internet Users Play Massively Multiplayer Online Role-Playing Games? A Mixed Method. *Management Decision*, 47, 8, 1245−1260.

Festinger, L. (1957) A Theory of Cognitive Dissonance. Stanford University Press: Stanford, CA.

Fetscherin, M. − Lattemann, C. (2008) User Acceptance of Virtual Worlds. *Journal of Electronic Commerce Research*, 9, 3, 231−242.

Finney, S. J. − DiStefano, C. (2006) Nonnormal and Categorical Data in Structural Equation Modeling. In: *Structural equation modeling: a second course.* Ed. by Hancock, G. R. and Mueller, R. O. IAP-Information Age Publishing: USA, 269−314.

Fishbein, M. (1967) Attitude and the Prediction of *Behaviour. In: *Readings in Attitude Theory and Measurement.* Ed. by Fishbein, M. Wiley: New York, NY, 477−492.

Fishbein, M. − Ajzen, I. (1975) Belief, Attitude, Intention, and Behavior: An Introduction to the Theory and Research. Addison-Wesley: Reading, MA.

Fornell, C. − Larcker, D. F. (1981) Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, 18, 1, 39−50.

Forsythe, S. M. − Shi, B. (2003) Consumer Patronage and Risk Perceptions in Internet Shopping. *Journal of Business Research*, 56, 11, 867−875.

Fowler, F. J. (2002) Survey Research Methoods (3rd Edition). SAGE Publications: Thousand Oaks, CA.

Franceschi, K. − Lee, R. M. − Zanakis, S. H. − Hinds, D. (2009) Engaging Group E-Learning in Virtual Worlds. *Journal of Management Information Systems*, 26, 1, 73−100.

Fulk, J. − Schmitz, J. − Power, G. J. (1987) A Social Information Processing Model of Media use in Organizations. *Communication Research*, 14, 5, 520−552.

Füller, J. (2010) Refining Virtual Co-Creation from a Consumer Perspective. *California Management Review*, 52, 2, 98−122.

Fuller, M. A. − Serva, M. A. − Benamati, J. ". (2007) Seeing is Believing: The Transitory Influence of Reputation Information on E-Commerce Trust and Decision Making. *Decision Sciences,* 38, 4, 675−699.

Garton, L. − Haythornthwaite, C. − Wellman, B. (1999) Studying Online Social Networks. In: Ed. by Jones, S. SAGE: Thousands Oaks, CA, 75−105.

Gefen, D. (2002) Customer Loyalty in E-Commerce. *Journal of the Association for Information Systems,* 3, 1, 27−51.

Gefen, D. (1997) Gender Differences in the Perception and use of E-Mail: An Extension to the Technology Acceptance Model. *MIS Quarterly,* 21, 4, 389−400.

Gefen, D. − Karahanna, E. − Straub, D. W. (2003) Trust and TAM in Online Shopping: An Integrated Model. *MIS Quarterly; Minneapolis,* 27, 1, 51−90.

Gefen, D. − Straub, D. W. (2004) Consumer Trust in B2C e-Commerce and the Importance of Social Presence: Experiments in e-Products and e-Services. *Omega,* 32, 6, 407−424.

Gefen, D. − Straub, D. W. − Boudreau, M. (2000) Structural Equation Modeling and Regression: Guidelines for Research Practice. *Communications of the Association for Information Systems,* 4, 7, 1−78.

Gefen, D. − Straub, D. W. (2004) Consumer Trust in B2C e-Commerce and the Importance of Social Presence: Experiments in e-Products and e-Services. *Omega; Oxford,* 32, 6, 407−424.

Gefen, D. − Straub, D. W. (2003) Managing User Trust in B2C e-Services. *E Service Journal;,* 2, 2, 7−24.

Goodhue, D. L. − Thompson, R. L. (1995) Task-Technology Fit and Individual Performance. *MIS Quarterly,* 19, 2, 213−236.

Griffith, M. − Light, B. (2008) Social Networking and Digital Gaming Media Convergence: Classification and its consequences for Appropriation. *Information Systems Frontiers,* 10, 4, 447−459.

Grover, V. − Lee, C. C. − Durand, D. − Durand, D. (1993) Analyzing Methodological Rigor of MIS Survey Research from 1980–1989. *Information & Management,* 24, 6, 305−317.

Guba, E. G. (1990) The Alternative Paradigm Dialog. In: *The Paradigm Dialog.* Ed. by Guba, E. G. SAGE Publications: Newbury Park, CA, 17−29.

Guo, Y. − Barnes, S. (2009) Virtual Item Purchase Behavior in Virtual Worlds: An Exploratory Investigation. *Electronic Commerce Research,* 9, 1−2, 77−96.

Ha, S. − Stoel, L. (2009) Consumer e-Shopping Acceptance: Antecedents in a Technology Acceptance Model. *Journal of Business Research,* 62, 5, 565−571.

Hair, J. F. − Anderson, R. E. − Tatham, R. L. − Black, W. C. (1992.) Multivariate Data Analysis with Readings. Macmillan: New York.

Hansen, T. − Møller Jensen, J. − Stubbe Solgaard, H. (2004) Predicting Online Grocery Buying Intention: A Comparison of the Theory of Reasoned Action and the Theory of Planned Behavior. *International Journal of Information Management,* 24, 6, 539−550.

Harris, L. C. (2004) The Four Levels of Loyalty and the Pivotal Role of Trust: A Study of Online Service Dynamics. *Journal of Retailing,* 80, 2, 139−158.

Hassanein, K. − Head, M. (2006) The Impact of Infusing Social Presence in the Web Interface: An Investigation Across Product Types. *International Journal of Electronic Commerce,* 10, 2, 31−55.

Hassanein, K. − Head, M. (2007) Manipulating Perceived Social Presence through the Web Interface and its Impact on Attitude Towards Online Shopping. *International Journal of Human−Computer Studies,* 65, 8, 689−708.

Helgesen, Ø. (2006) Are Loyal Customers Profitable? Customer Satisfaction, Customer (Action) Loyalty and Customer Profitability at the Individual Level. *Journal of Marketing Management,* 22, 3, 245−266.

Hemp, P. (2006) Avatar-Based Marketing. *Harvard Business Review,* 84, 6, 48−57.

Hemp, P. (2008) Getting Real about Virtual Worlds. *Harvard Business Review,* 86, 10, 27−28.

Hernandez, B. − Jimenez, J. − Jose Martin, M. (2009a) The Impact of Self-Efficacy, Ease of use and Usefulness on e-Purchasing: An Analysis of Experienced e-Shoppers. *Interacting with Computers,* 21, 1−2, 146−156.

Hernandez, B. − Jimenez, J. − Martin, M. J. (2009b) Adoption Vs Acceptance of e-Commerce: Two Different Decisions. *European Journal of Marketing,* 43, 9, 1232−1245.

Hong, S. − 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. − Thong, J. Y. L. − 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, 1819−1834.

Hsieh, J. J. P. − Rai, A. − Keil, M. (2008) Understanding Digital Inequality: Comparing Continued use Behavioral Models of the Socio−Economically Advantaged and Disadvantaged. *MIS Quarterly,* 32, 1, 97−126.

Hsu, C. − Lin, J. C. (2008) Acceptance of Blog Usage: The Roles of Technology Acceptance, Social Influence and Knowledge Sharing Motivation. *Information & Management,* 45, 1, 65−74.

Hsu, C. − Lu, H. (2007) Consumer Behavior in Online Game Communities: A Motivational Factor Perspective. *Computers in Human Behavior,* 23, 3, 1642−1659.

Hsu, C. − Lu, H. (2004) Why do People Play on-Line Games? an Extended TAM with Social Influences and Flow Experience. *Information & Management,* 41, 7, 853−868.

Hsu, M. − Chiu, C. (2004) Internet Self-Efficacy and Electronic Service Acceptance. *Decision Support Systems,* 38, 3, 369−381.

Hsu, M. − Ju, T. L. − Yen, C. − Chang, C. (2007) Knowledge Sharing Behavior in Virtual Communities: The Relationship between Trust, Self-Efficacy, and Outcome Expectations. *International Journal of Human−Computer Studies,* 65, 2, 153−169.

Hsu, M. − Yen, C. − Chiu, C. − Chang, C. (2006) A Longitudinal Investigation of Continued Online Shopping Behavior: An Extension of the Theory of Planned Behavior. *International Journal of Human-Computer Studies,* 64, 9, 889−904.

Hu, P. J. − Chau, P. Y. K. − Liu Sheng, O. R. − Tam, K. Y. (1999) Examining the Technology Acceptance Model using Physician Acceptance of Telemedicine Technology. *Journal of Management Information Systems,* 16, 2, 91−112.

Hu, L. − Bentler, P. M. (1999) Cutoff Criteria for Fit Indices in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives. *Structual Equaltion Modeling,* 6, 1, 1−55.

Hua, G. − Haughton, D. (2009) Virtual Worlds Adoption: A Research Framework and Empirical Study. *Online Information Review*, 33, 5, 889−900.

Huh, H. J. − Kim, T. (. − Law, R. (2009) A Comparison of Competing Theoretical Models for Understanding Acceptance Behavior of Information Systems in Upscale Hotels. *International Journal of Hospitality Management*, 28, 1, 121−134.

Hunt, S. D. (2002) Foundations of Marketing Theory: Toward a General Theory of Marketing. M.E. Sharpe: Armonk, NY.

Igbaria, M. − Iivari, J. − Maragahh, H. (1995) Why do Individuals use Computer Technology? A Finnish Case Study. *Information & Management*, 29, 5, 227−238.

Iqbal, A. − Kankaanranta, M. − Neittaanmäki, P. (2010) Experiences and Motivations of the Young for Participation in Virtual Worlds. *Procedia Social and Behavioral Sciences*, 2, 2010, 3190−3197.

Järvinen, P. (2004) On Research Methdos. Opinpajan kirja: Tampere, Finland.

Jasperson, J. − Carter, P. E. − Zmud, R. W. (2005) A Comprehensive Conceptualization of Post-Adoptive Behaviors Associated with Information Technology Enabled Work Systems. *MIS Quarterly*, 29, 3, 525−557.

Jin, X. − Lee, M. K. O. − Cheung, C. M. K. (2010) Predicting Continuance in Online Communities: Model Development and Empirical Test. *Behaviour & Information Technology*, 29, 4, 383−394.

Jöreskog, K. G. − Sörbom, D. (1993) LISREL8 User's Reference Guide. Science Software: Chicago, IL.

Jung, Y. − Kang, H. (2010) User Goals in Social Virtual Worlds: A Means-End Chain Approach. *Computers in Human Behavior*, 26, 2, 218−225.

Kang, Y. S. − Hong, S. − Lee, H. (2009) Exploring Continued Online Service Usage Behavior: The Roles of Self-Image Congruity and Regret. *Computers in Human Behavior*, 25, 1, 111−122.

Kang, Y. S. − Lee, H. (2010) Understanding the Role of an IT Artifact in Online Service Continuance: An Extended Perspective of User Satisfaction. *Computers in Human Behavior*, 2006, 3, 353−364.

Kaplan, A. − Haenlein, M. (2009) The Fairyland of Second Life: Virtual Social Worlds and how to use them. *Business Horizons*, 52, 6, 563−572.

Karahanna, E. − Evaristo, J. R. − Srite, M. (2005) Levels of Culture and Individual Behavior: An Integrative Perspective. *Journal of Global Information Management,* 13, 2, 1−20.

Karahanna, E. − Straub, D. W. − Chervany, N. L. (1999) Information Technology Adoption Across Time: A Cross-Sectional Comparison of Pre-Adoption and Post-Adoption Beliefs. *MIS Quarterly,* 23, 2, 183−213.

Karahanna, E. − Straub, D. W. (1999) The Psychological Origins of Perceived Usefulness and Ease-of-use. *Information & Management,* 35, 4, 237−250.

Katz, M. L. − Shapiro, C. (1985) Network Externalities, Competition, and Compatibility. *The American Economic Review,* 75, 3, 424−440.

Katz, M. L. − Shapiro, C. (1986) Technology Adoption in the Presence of Network Externalities. *The Journal of Political Economy,* 94, 4, 822−841.

Kelman, H. C. (1958) Compliance, Identification and Internalization: Three Processes of Attitude Change. *Journal of Consumer Behaviour,* 2, 1, 51−60.

Kelman, H. C. (1961) Process of Opinion Change. *Public Opinion Quarterly,* 25, 1, 57−78.

Khalifa, M. − Liu, V. (2007) Online Consumer Retention: Contingent Effects of Online Shopping Habit and Online Shopping Experience. *European Journal of Information Systems,* 16; 6 780−792.

Kim, D. J. − Ferrin, D. L. − Rao, H. R. (2009) Trust and Satisfaction, Two Stepping Stones for Successful E-Commerce Relationships: A Longitudinal Exploration. *Information Systems Research,* 20, 2, 237−257.

Kim, D. J. − Song, Y. I. − Baynov, S. B. − Rao, H. R. (2005) A Multidimensional Trust Formation Model in B-to-C e-Commerce: A Conceptual Framework and Content Analyses of academia/practitioner Perspectives. *Decision Support Systems,* 40, 2, 143−165.

Kim, G. − Shin, B. − Grover, V. (2010) Investigating Two Contradictory Views of Formative Measurement in Information Systems Research. *MIS Quarterly,* 34, 2, 345−365.

Kim, H. − Chan, H. C. − Chan, Y. P. (2007) A Balanced thinking–feelings Model of Information Systems Continuance. *International Journal of Human−Computer Studies,* 65, 6, 511−525.

Kim, S. S. (2009) The Integrative Framework of Technology use: An Extension and Test. *MIS Quarterly,* 33, 3, 513−537.

Kim, S. S. − Malhotra, N. K. (2005) A Longitudinal Model of Continued IS use: An Integrative View of Four Mechanisms Underlying Postadoption Phenomena. *Management Science,* 51, 5, 741−755.

Kim, S. S. − Son, J. (2009) Out of Dedication Or Constraint? a Dual Model of Post-Adoption Phenomena and its Empirical Test in the Context of Online Services. *MIS Quarterly,* 33, 1, 49−70.

Kohler, T. − Matzler, K. − Füller, J. (2009) Avatar-Based Innovation: Using Virtual Worlds for Real-World Innovation. *Technovation,* 29, 6/7, 395−407.

Kohler, T − Füller, J. − Stieger, D. − Matzler, K. (2011) Avatar-based innovation: Consequences of the virtual co-creation experience. Computers in Human Behavior, 27, 1, 160−168.

Koufaris, M. (2002) Applying the Technology Acceptance Model and Flow Theory to Online Consumer Behavior. *Information Systems Research,* 13, 2, 205−223.

Kraut, R. E. − Rice, R. E. − Cool, C. − Fish, R. S. (1998) Varieties of Social Influence: The Role of Utility and Norms in the Success of a New Communication Medium. *Organization Science,* 9, 4, 437−453.

Kuhn, T. S. (1970) The Structure of Scientific Revolutions, 2nd Edition. Chicago University Press: Chicago.

Larsen, T. J. − Sørebø, A. M. − Sørebø, Ø. (2009) The Role of Task-Technology Fit as Users' Motivation to Continue Information System use. *Computers in Human Behavior,* 25, 3, 778−784.

Lawler, E. E. − Porter, L. W. (1967) Antecedent Attitudes of Effective Managerial Performance. *Organizational Behavior and Human Performance,* 2, 2, 122−142.

Lee, A. S. − Baskerville, R. L. (2003) Generalizing Generalizability in Information Systems Research. *Information Systems Research,* 14, 3, 221−243.

Lee, Y. − Kozar, K. A. − Larsen, K. R. T. (2003) The Technology Acceptance Model: Past, Present, and Future. *Communications of AIS,* 2003, 12, 752−780.

Legris, P. − Ingham, J. − Collerette, P. (2003) Why do People use Information Technology? A Critical Review of the Technology Acceptance Model. *Information & Management,* 40, 3, 191−204.

Lehdonvirta, V. (2009a) Virtual Item Sales as a Revenue Model: Identifying Attributes that Drive Purchase Decisions. *Electronic Commerce Research,* 9, 1−2, 97−113.

Lehdonvirta, V. (2009b) Virtual Consumption. Doctoral dissertation: Turku School of Economics: Turku, Finland.

Lehdonvirta, V. − Wilska, T. − Johnson, M. (2009) Virtual Consumerism. *Information, Communication & Society,* 12, 7, 1059−1079.

Li, D. − Chau, P. Y. K. − Van Slyke, C. (2010) A Comparative Study of Individual Acceptance of Instant Messaging in the US and China: A Structural Equation Modeling Approach. *Communications of the Association for Information Systems,* 26, 5, 85−106 .

Li, D. − Chua, P. Y. K. − Lu, H., Lou. (2005) Understanding Individual Adoption of Instant Messaging: An Empirical Investigation. *Journal of the Association for Information Systems,* 6, 4, 102−129.

Liao, C. (2007) Theory of Planning Behavior (TPB) and Customer Satisfaction in the Continued use of e-Service: An Integrated Model. *Computers in Human Behavior,* 23, 6, 2804−2822.

Liao, C. − Palvia, P. − Chen, J. (2009) Information Technology Adoption Behavior Life Cycle: Toward a Technology Continuance Theory (TCT). *International Journal of Information Management,* 29, 4, 309−320.

Limayem, M. − Cheung, C. M. K. (2008) Understanding Information Systems Continuance: The Case of Internet-Based Learning Technologies. *Information & Management,* 45, 4, 227−232.

Limayem, M. − Hirt, S. G. − Cheung, C. M. K. (2007) How Habit Limits the Predictive Power of Intention: The Case of Information Systems Continuance. *MIS Quarterly,* 31, 4, 705−738.

Limayem, M. − Khalifa, M. − Frini, A. (2000) What Makes Consumers Buy from Internet? A Longitudinal Study of Online Shopping. *IEEE Transactions on Systems, Man and Cybernetics. Part A. Systems and Humans,* 30, 4, 421−432.

Lin, C. − Bhattacherjee, A. (2008) Elucidating Individual Intention to use Interactive Information Technologies: The Role of Network Externalities. *International Journal of Electronic Commerce,* 13, 1, 85−108.

Lin, C. S. − Wu, S. − Tsai, R. J. (2005) Integrating Perceived Playfulness into Expectation-Confirmation Model for Web Portal Context. *Information & Management,* 42, 5, 683−693.

Lin, C. − Bhattacherjee, A. (2010) Extending Technology Usage Models to Interactive Hedonic Technologies: A Theoretical Model and Empirical Test. *Information Systems Journal*, 20, 2, 163−181.

Lin, H. (2007) Predicting Consumer Intentions to Shop Online: An Empirical Test of Competing Theories. *Electronic Commerce Research and Applications*, 6, 4, 433−442.

Lin, H. − Lee, G. (2006) Determinants of Success for Online Communities: An Empirical Study. *Behaviour & Information Technology*, 25, 6, 479−488.

Lombard, M. − Ditton, T. (1997) At the Heart of it all: The Concept of Presence. *Journal of Computer-Mediated Communication*, 3, 2.

Longino, H. E. (2002) The Fate of Knowledge. Princeton University Press: Princeton, NJ.

Lou, H. − Luo, W. − Strong, D. (2000) Perceived Critical Mass Effect on Groupware Acceptance. *European Journal of Information Systems*, 9, 2, 91−103.

Lu, Y. − Zhao, L. − Wang, B. (2010) From Virtual Community Members to C2C e-Commerce Buyers: Trust in Virtual Communities and its Effect on Consumers' Purchase Intention. *Electronic Commerce Research and Applications*, 26, 4, 346−360.

Malhotra, M. K. − Grover, V. (1998) An Assessment of Survey Research in POM: From Constructs to Theory. *Journal of Operations Management*, 16, 4, 407−425.

Malhotra, N. K. − Kim, S. S. − Patil, A. (2006) Common Method Variance in IS Research: A Comparison of Alternative Approaches and a Reanalysis of Past Research. *Management Science*, 52, 12, 1865−1883.

Marcoulides, G. A. − C. Saunders (2006) PLS: A Silver Bullet? *MIS Quarterly*, 30, 2, 3−9.

Maslow, A. H. (1954) Motivation and Personality. Harper & Row, Publishers, Inc.: New York, NY.

Mathieson, K. (1991) Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior. *Information Systems Research*, 2, 3, 173−191.

McCloskey, D. W. (2006) The Importance of Ease of use, Usefulness, and Trust to Online Consumers: An Examination of the Technology Acceptance Model with Older Consumers. *Journal of Organizational and End User Computing*, 18, 3, 47−65.

McKinney, V. − Yoon, K. − Zahedi, F. (2002) The Measurement of Web-Customer Satisfaction: An Expectation and Disconfirmation Approach. *Information Systems Research*, 13, 3, 296−315.

McKnight, D. H. − Choudhury, V. − Kacmar, C. (2002) Developing and Validating Trust Measures for e-Commerce: An Integrative Typology. *Information Systems Research*, 13, 3, 334−359.

Mennecke, B. E. − Terando, W. D. − Janvrin, D. J. − Dilla, W. N. (2007) It's just a Game, Or is it? Real Money, Real Income, and Real Taxes in Virtual Worlds. *Communications of the Association for Information Systems*, 20, 134−141.

Merikivi, J. − Mäntymäki, M. (2009) Explaining the Continuous use of Social Virtual Worlds: An Applied Theory of Planned Behavior Approach. *Proceedings of the 42nd Hawaii Conference on System Sciences*, Waikoloa, Big Island, Hawaii.

Messinger, P. R. − Stroulia, E. − Lyons, K. − Bone, M. − Niu, R. H. − Smirnov, K. − Perelgut, S. (2009) Virtual Worlds − Past, Present, and Future: New Directions in Social Computing. *Decision Support Systems*, 47, 3, 204−228.

Mingers, J. (2001) Combining IS Research Methods: Towards a Pluralist Methodology. *Information Systems Research*, 12, 3, 240−259.

Mingers, J. (2003) The Paucity of Multimethod Research: A Review of the Information Systems Literature. *Information Systems Journal*, 13, 3, 233−249.

Moon, J. − Kim, Y. (2001) Extending the TAM for a World-Wide-Web Context. *Information & Management*, 38, 4, 217−230.

Moore, G. C. − Benbasat, I. (1991) Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research*, 2, 3, 192−222.

Morgan, D. D. (1998) Practical Strategies for Combining Qualitative and Quantitative Methods: Application to Health Research. *Qualitative Health Research*, 8, 3, 362−376.

Morgan, G. − Smircich, L. (1980) The Case for Qualitative Research. *The Academy of Management Review*, 5, 4, 491−500.

Mäntymäki, M. (2009) Customer Loyalty in Social Virtual Worlds. *Proceedings of the 22nd Bled eConference eEnablement: Facilitating an Open, Effective and Representative eSociety,* Bled, Slovenia.

Mäntymäki, M. − Merikivi, J. (2010a) Investigating the Drivers of the Continuous use of Social Virtual Worlds. Koloa, Kauai, Hawaii.

Mäntymäki, M. − Merikivi, J. (2010b) Uncovering the Motives for the Continuous use of Social Virtual Worlds. *Proceedings of the 18th European Conference of Information Systems (ECIS 2010),* Pretoria, South Africa.

Mäntymäki, M. − Salo, J. (forthcoming) Continuous use and Purchasing Behavior in Social Virtual Worlds. *In Review Process, Computers in Human Behavior*.

Mäntymäki, M. − Salo, J. (2010) Trust, Social Presence and Customer Loyalty in Social Virtual Worlds. *23rd Bled eConference eTrust: Implications for the Individual, Enterprises and Society,* Bled, Slovenia.

Mäntymäki, M., − Merikivi, J. − Verhagen, T. − Feldberg, F. − Rajala, R. (forthcoming) Still There? Understanding the continued use of virtual worlds, *In Review Process, Decision Support Systems.*

Noam, E. M. (1992) Innovation, Networks, and Organizational Learning. In: *The Economics of Information Networks.* Ed. by Antonelli, C. Elsevier Science Publishers: Amsterdam, 91−102.

Nojima, M. (2007) Pricing Models and Motivations for MMO Play. In *proceedings of DiGRA 2007 Conference*.

Novak, T. P. − Hoffman, D. L. − Yiu-Fai Yung. (2000) Measuring the Customer Experience in Online Environments: A Structural Modeling Approach. *Marketing Science,* 19, 1, 22−42.

Oh, G. − Ryu, T. (2007) Game Design on Item-Selling Based Payment Model in Korean Online Games. In *proceedings of DiGRA 2007 Conference*.

Oliver, R. L. (1999) Whence Consumer Loyalty? *Journal of Marketing,* 63, 33−44.

Oliver, R. L. − Linda, G. (1981) Effect of Satisfaction and its Antecedents on Consumer Preference and Intention. *Advances in Consumer Research,* 8, 1, 88−93.

Orlikowski, W. J. − Baroudi, J. J. (1991) Studying Information Technology in Organizations: Research Approaches and Assumptions. *Information Systems Research,* 2, 1, 1−28.

Ortiz, d. G. − Markus, M. L. (2009) Why Break the Habit of a Lifetime? Rethinking the Roles of Intention, Habit, and Emotion in Continuing Information Technology use. *MIS Quarterly,* 33, 3, 433−444.

Palfrey, J. − Gasser, U. (2008) Born Digital: Understanding the First Generation of Digital Natives. Basic Books: New York, NY.

Parameswaran, M. − Whinston, A. B. (2007) Research Issues in Social Computing . *Journal of the Association for Information Systems,* 8, 6, 336−350.

Parthasarathy, M. − Bhattacherjee, A. (1998) Understanding Post-Adoption Behavior in the Context of Online Services. *Information Systems Research,* 9, 4, 362−379.

Pavlou, P. A. − Fygenson, M. (2006) Understanding and Predicting Electronic Commerce Adoption: An Extension of the Theory of Planned Behavior. *MIS Quarterly,* 30, 1, 115−143.

Pavlou, P. A. (2003) Consumer Acceptance of Electronic Commerce: Integrating Trust and Risk with the Technology Acceptance Model. *International Journal of Electronic Commerce,* 7, 3, 101−134.

Pavlou, P. A. − Huigang Liang − Yajiong Xue. (2007) Understanding and Mitigating Uncertainty in Online Exchange Relationships: A Principal−Agent Perspective. *MIS Quarterly,* 31, 1, 105−136.

Petter, S. − Straub, D. − Rai, A. (2007) Specifying Formative Constructs in Information Systems Research. *MIS Quarterly,* 31, 4, 623−656.

Pinkwart, N. − Olivier, H. (2009) Cooperative Virtual Worlds − a Viable eCollaboration Pathway Or Merely a Gaming Trend? *Electronic Markets,* 19, 4, 233−236.

Pinsonneault, A. − Kraemer, K. L. (1993) Survey Research Methodology in Management Information Systems: An Assessment. *Journal of Management Information Systems,* 10, 2, 75−106.

Poddar, A. − Donthu, N. − Wei, Y. (2009) Web Site Customer Orientations, Web Site Quality, and Purchase Intentions: The Role of Web Site Personality. *Journal of Business Research,* 62, 4, 441−450.

Podsakoff, P. M. − MacKenzie, S. B. − Lee, J. − Podsakoff, N. P. (2003) Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies. *Journal of Applied Psychology,* 88, 5, 879−903.

Porter, C. E. (2004) A Typology of Virtual Communities. *Journal of Computer-Mediated Communication,* 10, 1, Article 3.

Porter, L. W. (1961) A Study of Perceived Need Satisfactions in Bottom and Middle Management Jobs. *Journal of Applied Psychology*, 45, 1, 1−10.

Premkumar, G. − Bhattacherjee, A. (2008) Explaining Information Technology Usage: A Test of Competing Models. *Omega*, 36, 1, 64−75.

Reeves, B. − Malone, T. W. − O'Driscoll, T. (2008) LEADERSHIP'S Online Labs. (Cover Story). *Harvard Business Review*, 86, 5, 58−66.

Reichheld, F. F. (2000) E-Customer Loyalty − Applying the Traditional Rules of Business for Online Success. *European Business Journal*, 12, 4, 173−179.

Reinartz, W. − Haenlein, M. − Henseler, J. (2009) An Empirical Comparison of the Efficacy of Covariance-Based and Variance-Based SEM. *International Journal of Research in Marketing*, 26, 4, 332−344.

Rheingold, H. (2000) The Virtual Community: Homesteading on the Electronic Frontier. MIT Press: Cambridge, MA.

Robbins, R. − Butler, B. (2009) Selecting a Virtual World Platform for Learning. *Journal of Information Systems Education*, 20, 2, 199.

Roca, J. C. − Gagné, M. (2008) Understanding e-Learning Continuance Intention in the Workplace: A Self-Determination Theory Perspective. *Computers in Human Behavior*, 24, 4, 1585−1604.

Rogers, E., M. (2003) Diffusion of Innovations (5th Edition). Free Press: New York, NY.

Rust, R. T. − Moorman, C. − Bhalla, G. (2010) Rethinking Marketing. (Cover Story). *Harvard Business Review*, 88, 1, 94−101.

Schaupp, L. C. − Carter, L. − McBride, M. E. (2010) E-File Adoption: A Study of U.S. Taxpayers' Intentions. *Computers in Human Behavior*, 26, 4, 636−644.

Schepers, J. − Wetzels, M. (2007) A Meta-Analysis of the Technology Acceptance Model: Investigating Subjective Norm and Moderation Effects. *Information & Management*, 44, 1, 90−103.

Schlosser, A. E. (2006) Converting Web Site Visitors into Buyers: How Web Site Investment Increases Consumer Trusting Beliefs and Online Purchase Intentions. *Journal of Marketing*, 70, 2, 2006, 133−148.

Schonlau, M. − van Soest, A. − Kapteyn, A. − Couper, M. (2009) Selection Bias in Web Surveys and the use of Propensity Scores. *Sociological Methods & Research*, 37, 3, 291−318.

Schultze, U. − Hiltz, S. R. − Nardi, B. − Rennecker, J. − Stucky, S. (2008) Using Synthetic Worlds for Work and Learning. *Communications of AIS,* 2008, 22, 351−370.

Schultze, U (2010) Embodiment and Presence in Virtual Worlds: a review. *Journal of Information Technology*, 25, 4, 434−449.

Scott, W. E. − Farh, J. − Podsakoff, P. M. (1988) The Effects of "intrinsic" and "extrinsic" Reinforcement Contingencies on Task Behavior. *Organizational Behavior and Human Decision Processes,* 41, 3, 405−425.

Shang, R. − Chen, Y. − Shen, L. (2005) Extrinsic Versus Intrinsic Motivations for Consumers to Shop on-Line. *Information & Management,* 42, 3, 401−413.

Shankar, V. − Smith, A. K. − Rangaswamy, A. (2003) Customer Satisfaction and Loyalty in Online and Offline Environments. *International Journal of Research in Marketing,* 20, 2, 153−175.

Shapiro, C. − Varian, H. R. (1999) Information Rules: A Strategic Guide to the Network Economy. Harvard Business School Press: Boston, MA.

Sharma, R. − Yetton, P. − Crawford, J. (2009) Estimating the Effect of Common Method Variance: The Method-Method Pair Technique with an Illustration from Tam Research. *MIS Quarterly,* 33, 3, 473−490.

Shelton, A. K. (2010) Defining the Lines Between Virtual and Real Purchases: Second Life Sells, But Who's Buying? *Computers in Human Behavior*, 26, 6, 1223−1227.

Shen, J. − Eder, L. (2009a) Exploring Intentions to use Virtual Worlds for Business. *Journal of Electronic Commerce Research,* 10, 2, 94−103.

Shen, J. − Eder, L. (2009b) Intentions to use Virtual Worlds for Education. *Journal of Information Systems Education,* 20, 2, 225−233.

Sheppard, B. H. − Hartwick, J. − Warshaw, P. R. (1988) The Theory of Reasoned Action: A Meta-Analysis of Past Research with Recommendations for Modifications and Future Research. *Journal of Consumer Research,* 15, 3, 325-343.

Shih, H. (2004) An Empirical Study on Predicting User Acceptance of e-Shopping on the Web. *Information & Management,* 41, 3, 351−368.

Shim, S. − Eastlick, M. A. − Lotz, S. L. − Warrington, P. (2001) An Online Prepurchase Intentions Model: The Role of Intention to Search. *Journal of Retailing,* 77, 3, 397−416.

Shin, D. (2009) The Evaluation of User Experience of the Virtual World in Relation to Extrinsic and Intrinsic Motivation. *International Journal of Human − Computer Interaction,* 25, 6, 530−553.

Shin, D. (2009b) Analysis of Online Social Networks: a cross-national study. Online Information Review, 34, 3, 473−495.

Shin, D. H. (2008) Understanding Purchasing Behaviors in a Virtual Economy: Consumer Behavior Involving Virtual Currency in Web 2.0 Communities. *Interacting with Computers,* 20, 4−5, 433−446.

Short, J. − Williams, E. − Christie, B. (1976) The Social Psychology of Telecommunications. Wiley: London.

Shropshire, K. O. − Hawdon, J. E. − Witte, J. C. (2009) Web Survey Design: Balancing Measurement, Response, and Topical Interest. *Sociological Methods & Research,* 37, 3, 344−370.

Sia, C. L. − Lim, K. H. − Leung, K. − Lee, M. K. O. − Huang, W. W. − Benbasat, I. (2009) Web Strategies to Promote Internet Shopping: Is Cultural-Customization Needed? *MIS Quarterly,* 33, 3, 491−512.

Sledgianowski, D. − Kulviwat, S. (2009) Using Social Network Sites: The Effects of Playfulness, Critical Mass and Trust in a Hedonic Context. *The Journal of Computer Information Systems,* 49, 4, 74−83.

Smith, M. L. (2006) Overcoming Theory-Practice Inconsistencies: Critical Realism and Information Systems Research. *Information and Organization,* 16, 3, 191−211.

Sosik, J. J. − Kahai, S. S. − Piovoso, M. J. (2009) Silver Bullet Or Voodoo Statistics? A Primer for using the Partial Least Squares Data Analytic Technique in Group and Organization Research. *Group & Organization Management,* 34, 1, 5−36.

Spence, J. (2008) Demographics of Virtual Worlds. *Journal of Virtual Worlds Research,* 1, 2, (available online).

Spiller, J. − Vlasic, A. − Yetton, P. (2007) Post-Adoption Behavior of Users of Internet Service Providers. *Information & Management,* 44, 6, 513−523.

Straub, D. W. (1989) Validating Instruments in MIS Research. *MIS Quarterly,* 13, 2, 147−169.

Straub, D. − Boudreau, M. − Gefen, D. (2004) Validation Guidelines for is Positivist Research. *Communications of AIS,* 2004, 13, 380−427.

Straub, D. − Karahanna, E. (1998) Knowledge Worker Communications and Recipient Availability: Toward a Task Closure Explanation of Media Choice. *Organization Science,* 9, 2, 160−175.

Straub, D. − Keil, M. (1997) Testing the Technology Acceptance Model Across Cultures: A Three Country Study. *Information & Management,* 33, 1, 1, 1−11.

Strauss, A. − Corbin, J. (1990) Basics of Qualitative Research: Grounded Theory Procedures and Techniques. SAGE Publications: Newbury Park, CA.

Sun, H. − Zhang, P. (2006) The Role of Moderating Factors in User Technology Acceptance. *International Journal of Human-Computer Studies,* 64, 2, 53−78.

Szajna, B. (1996) Empirical Evaluation of the Revised Technology Acceptance Model. *Management Science,* 42, 1, 85−92.

Tabachnick, B. G. − Fidell, L. S. (2007) Using Multivariate Statistics. Pearson Education Inc.: Boston, MA.

Taylor, S. − Todd, P. A. (1995a) Decomposition and Crossover Effects in the Theory of Planned Behavior: A Study of Consumer Adoption Intentions. *International Journal of Research in Marketing,* 12, 2, 137−155.

Taylor, S. − Todd, P. A. (1995b) Understanding Information Technology Usage: A Test of Competing Models. *Information Systems Research,* 6, 2, 144−176.

Teo, T. S. H. − Lim, V. K. G. − Lai, R. Y. C. (1999) Intrinsic and Extrinsic Motivation in Internet Usage. *OMEGA International Journal of Management Science,* 27, 1, 25−37.

Thatcher, J. B. − George, J. F. (2004) Commitment, Trust, and Social Involvement: An Exploratory Study of Antecedents to Web Shopper Loyalty. *Journal of Organizational Computing and Electronic Commerce,* 14, 4, 243.

Thompson, R. L. − Higgins, C. A. − Howell, J. M. (1991) Personal Computing: Toward a Conceptual Model of Utilization. *MIS Quarterly,* 15, 1, 125−143.

Thong, J. Y. L. − Hong, S. − Tam, K. Y. (2006) The Effects of Post-Adoption Beliefs on the Expectation-Confirmation Model for Information Technology Continuance. *International Journal of Human-Computer Studies,* 64, 9, 799−810.

Thorbjørnsen, H. − Pedersen, P. E. − Nysveen, H. (2007) This is Who i Am": Identity Expressiveness and the Theory of Planned Behavior. *Psychology & Marketing,* 24, 9, 763−785.

Tikkanen, H. − Hietanen, J. − Henttonen, T. − Rokka, J. (2009) Exploring Virtual Worlds: Success Factors in Virtual World Marketing. *Management Decision,* 47, 8, 1357−1381.

Torkzadeh, G. − Dhillon, G. (2002) Measuring Factors that Influence the Success of Internet Commerce. *Information Systems Research,* 13, 2, 187−204.

Tornatzky, L. G. − Klein, K. J. (1982) Innovation Characteristics and Innovation Adoption-Implementation: A Meta-Analysis of Findings. *IEEE Transactions on Engineering Management,* 29, 1, 28−45.

Triandis, H. C. (1989) The Self and Social Behavior in Differing Cultural Contexts. *Psychological Review,* 96, 3, 506−520.

Tucker, L. R. − Lewis, C. (1973) A Reliability Coefficient for Maximum Likelihood Factor Analysis. *Psychometrika,* 38, 1, 1−10.

Turel, O. − Serenko, A. − Bontis, N. (2010) User Acceptance of Hedonic Digital Artifacts: A Theory of Consumption Values Perspective. *Information & Management,* 47, 1, 53−59.

Valente, T. W. (1995) Network Models of the Diffusion of Innovations. Hampton Press: Cresskill (N.J.).

van der Heijden, H. (2004) User Acceptance of Hedonic Information Systems. *MIS Quarterly,* 28, 4, 695−704.

van der Heijden, H. − Verhagen, T. − Creemers, M. (2003) Understanding Online Purchase Intentions: Contributions from Technology and Trust Perspectives. *European Journal of Information Systems,* 12, 1, 41−48.

van Raaij, E. M. − Schepers, J. J. L. (2008) The Acceptance and use of a Virtual Learning Environment in China. *Computers & Education,* 50, 3, 838−852.

Van Slyke, C. (2007) Perceived Critical Mass and the Adoption of a Communication Technology. *European Journal of Information Systems,* 16, 3, 270−283.

Venkatesh, V. − Bala, H. (2008) Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences,* 39, 2, 273−315.

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. − Agarwal, R. (2006) Turning Visitors into Customers: A Usability-Centric Perspective on Purchase Behavior in Electronic Channels. *Management Science,* 52, 3, 367−382.

Venkatesh, V. − Brown, S. (2001) A Longitudinal Investigation of Personal Computers in Homes: Adoption Determinants and Emerging Challenges. *MIS Quarterly,* 25, 1, 71−102.

Venkatesh, V. − Davis, F. D. (2000) A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science,* 46, 2, 186−204.

Venkatesh, V. − Davis, F. D. − Morris, M. G. (2007) Dead Or Alive? The Development, Trajectory and Future of Technology Adoption Research. *Journal of the Association for Information Systems; Atlanta,* 8, 4, 267−286.

Venkatesh, V. − Morris, M. G. (2000) Why Don't Men Ever Stop to Ask for Dirrections? Gender, Social Influence, and their Role in Technology Acceptance and Usage Behavior. *MIS Quarterly,* 24, 1, 115−139.

Venkatesh, V. − Morris, M. G. − Davis, G. B. − Davis, F. D. (2003) User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly,* 27, 3, 425−478.

Vijayasarathy, L. R. (2004) Predicting Consumer Intentions to use on-Line Shopping: The Case for an Augmented Technology Acceptance Model. *Information & Management,* 41, 6, 747−762.

Wagner, C. (2008) Learning Experience with Virtual Worlds. *Journal of Information Systems Education,* 19, 3, 263−266.

Wagner, C. − Ip, R. (2009) Action Learning with Second Life − A Pilot Study. *Journal of Information Systems Education,* 20, 2, 249−258.

Walsham, G. (1995) The Emergence of Interpretivism in IS Research. *Information Systems Research,* 6, 4, 376−394.

Warburton, S. (2009) Second Life in Higher Education: Assessing the Potential for and the Barriers to Deploying Virtual Worlds in Learning and Teaching. *British Journal of Educational Technology,* 40, 3, 414−426.

Weber, M. (2002) The Protestant Ethic and the Spirit of Capitalism: And Other Writings. Penguin Books: New York, NY.

Weber, R. (2004) The Rhetoric of Positivism Versus Interpretivism: A Personal View, *MIS Quarterly, 28, 1*, 03, 2004, 3−12.

Webster, J. − Watson, R. T. (2002) Analyzing the Past to Prepare for the Future: Writing a Literature Review. *MIS Quarterly*, 26, 2, 13−23.

Webster, J. − Martocchio, J. J. (1992) Microcomputer Playfulness: Development of a Measure with Workplace Implications. *MIS Quarterly*, 16, 2, 201−226.

Weick, K. E. (1984) Theoretical Assumptions and Research Methodology Selection. In: *Information Systems Research Challenge.* Ed. by McFarlan, F. W. Harvard Business School: Boston, MA, 111−132.

Whetten, D. A. (1989) What Constitutes and Theoretical Contribution? *Academy of Management Review*, 14, 4, 490−495.

Wilcox, J. B. − Howell, R. D. − Breivik, E. (2008) Questions about Formative Measurement. *Journal of Business Research,* 61, 12, 1219−1228.

Wildemuth, B. M. (1993) Post-Posivist Research: Two Examples of Methological Pluralism. *Library Quarterly*, 63, 4, 450−468.

Williams, M. D. − Dwivedi, Y. K. − Lal, B. − Schwarz, A. (2009) Contemporary Trends and Issues in IT Adoption and Diffusion Research. *Journal of Information Technology*, 24, 1, 1−10.

Witte, J. C. (2009) Introduction to the Special Issue on Web Surveys. *Sociological Methods & Research,* 37, 3, 283−290.

Wixom, B. H. − Todd, P. A. (2005) A Theoretical Integration of User Satisfaction and Technology Acceptance. *Information Systems Research*, 16, 1, 85−102.

Wright, K. B. (2005) Researching Internet-Based Populations: Advantages and Disadvantages of Online Survey Research, Online Questionnaire Authoring Software Packages, and Web Survey Services. *Journal of Computer-Mediated Communication*, 10, 3, article 11.

Yi, M. Y. − Hwang, Y. (2003) Predicting the use of Web-Based Information Systems: Self-Efficacy, Enjoyment, Learning Goal Orientation, and the Technology Acceptance Model. *International Journal of Human-Computer Studies*, 59, 4, 431−449.

Yoo, Y. − Alavi, M. (2001) Media and Group Cohesion: Relative Influences on Social Presence, Task Participation, and Group Consensus. *MIS Quarterly*, 25, 3, 371−390.

Zhou, T. − Lu, Y. − Wang, B. (2010) Integrating TTF and UTAUT to Explain Mobile Banking User Adoption. *Computers in Human Behavior*, 26, 4, 760−767.

Zhou, Z. − Jin, X. − Vogel, D. R. − Fang, Y. − Chen, X. (2011) Individual Motivations and Demographic Differences in Social Virtual World Uses: An Exploratory Investigation in Second Life. *International Journal of Information Management*, 31, 3, 261−271.

Zhu, K. − Dong, S. − Sean Xin Xu − Kenneth L Kraemer. (2006) Innovation Diffusion in Global Contexts: Determinants of Post-Adoption Digital Transformation of European Companies. *European Journal of Information Systems; Basingstoke*, 15, 6, 601−616.

Zigurs, I. − Buckland, B. K. (1998) A Theory of Task/Technology Fit and Group Support Systems Effectiveness. *MIS Quarterly*, 22, 3, 313−334.

APPENDICES

Appendix 1 Different perspectives on virtual world research

Focus area	***Examples of studies***	***Key focus & findings***
Business & Marketing	Kaplan & Haenlein (2009)	Corporate opportunities in virtual social worlds and how to use them successfully Advertising v-commerce Marketing research HRM Internal process management
	Arakji & Lang (2008)	Business value created inside VWs. A calculation model for evaluating whether to establish a virtual store
	Kohler et al. (2009)	Use of VWs in innovation with customers
	Barnes & Mattsson (2008)	Hartman's axiological approach and value profile Consumer Evaluation of 8 consumer brands in SL
	Cagnina & Poian (2009)	Attempts to identify the drivers of successful business models
Education	Eschenbrenner et al. (2008)	Benefits and challenges related to using VWs in education
	Robbins & Butler (2009)	A framework for selecting the right VW category for certain pedagogical purposes
	Franceschi et al. (2009)	Virtual worlds suitable for group-learning in business education
Teamwork & group collaborations	Davis et al. (2009)	Conceptual model for research in metaverses that is based on five key constructs: (1) the metaverse itself, (2) people/avatars, (3) metaverse technology capabilities, (4) behaviours, and (5) outcomes
	Pinkwart & Olivier (2009)	Opportunities, risks and research challenges that are associated with using cooperative virtual environments (CVEs) as eCollaboration tools

Focus area	***Examples of studies***	***Key focus & findings***
Conceptual	Tikkanen et al. (2009)	Categorisations of VWs Conceptual model for VW marketing
	Messinger et al. (2009)	Overview of VWs
	Mennecke et al. (2007)	Research opportunities related to VWs
Psychology & behaviour	Chesney et al. (2009)	Negative behaviour in SL Reasons why 'griefing' occurs; showing superior SL knowledge and gaming culture brings fighting to SL
	Schultze (2010)	A conceptual review role and facets of embodiment and presence in VWs
	Bélisle & Onur Bodur (2010)	The relationship between users' targets, personality and the appearance of their avatars.

Appendix 2 Summary of the literature on continuous technology use

Paper	***Theoretical background***	***Sample***	***Main findings***
Parthasarathy & Bhattacherjee (1998)	Application of adopter classification By Rogers.	past and present online service users n=443	Discontinuers rely more heavily on interpersonal influence and less on external influence than adopters
Karahanna et al. (1999)	TRA + IDT	Windows users in n=268 (107 potential, 161 users)	Subjective norms influence only potential adopters
Bhattacherjee (2001a)	Expectation-(dis)confirmation theory TAM	Online brokerage users n=172	Continuance intention determined by PU and satisfaction
Bhattacherjee (2001b)	Expectation-(dis)confirmation theory + TAM	Online banking users n=122	Satisfaction and PU, influenced by confirmation, determine IS continuance intention
Larsen et al. (2009)	IS continuance model + Task–technology fit	students n=135	Satisfaction and utilisation determinants of continuance intention; PU has no direct or indirect effect
Thong et al. (2006)	Expectation-(dis)confirmation theory + TAM	E-government portal n=811	Ease of use stronger determinant of use intention than PU or ENJ
Limayem et al. (2007)	IS continuance model + habit	n=227 in all 3 rounds	Habit moderates between continuance intention and continuance usage
Limayem & Cheung (2008)	IS continuance model + habit	Web-based e-learning Students n=505 in 1st round and 313 second round	Satisfaction and prior behaviour predictors of continuance; habit weakens the intention–behaviour link
Hong et al. (2006b)	Expectation-confirmation model TAM Extended ECM	e-government portal in HK n=1826	TAM most parsimonious theory for explaining the continuous IT usage intention. Explanatory power of TAM (60%) almost the same as EECM-IT (67%)

Liao (2007)	TPB + expectation-confirmation theory + TAM	Cyber university n=400 online students	Satisfaction main determinant of use intention
Lin et al. (2005)	ECM + playfulness (immersion)	Web portal, undergraduates n=300	Playfulness is the determinant of satisfaction and use intention. Satisfaction is the main driver of intention
Kang et al. (2009)	TAM + user satisfaction + website quality	Cyworld users n= 254	Continuous use intention is influenced by customer satisfaction, perceived enjoyment and perceived usefulness
Kang & Lee (2010)	User satisfaction + TAM + computer anxiety + enjoyment	Cyworld users n=254	Website information satisfaction and system satisfaction are antecedents of PU and enjoyment but not of customer satisfaction
Roca & Gagné (2008)	TAM + self-determination theory	United Nations employees n=174	Perceived autonomy support -> PU & Playfulness Perceived Competence -> PU, playfulness, PEOU Perceived relatedness -> playfulness
Kim & Malhotra (2005)	TAM + habit + theory of belief updating + self perception theory	University portal Students n=298 wave 1 189 wave 2	In continued use the perception of PU is determined by prior perception of PU
Kim et al. (2009)	Valence framework + expectation-(dis)confirmation theory	2 rounds US university students n=468 pre-purchase phase and 258 post-purchase phase	Trust and satisfaction important contributors in B2C e-commerce relationships Trust contributes to willingness to purchase and satisfaction; satisfaction is a main determinant of e-loyalty
Hsieh et al. (2008)	Decomposed TPB	Internet-TV users n=451 mail survey	Attitude is the main predictor of continued use; subjective norms are insignificant

Kim et al. (2007)	TAM + pleasure + arousal	Mobile internet users n=218	Attitude is the main determinant of the continuance intention, followed by pleasure and usefulness Attitude affected by usefulness, pleasure and arousal
Hsu et al. (2006)	TPB + expectation-(dis)confirmation theory	Online shopping n=201 college students	2 phase survey, TPB components before and after use mediated through disconfirmation Longitudinal approach Continuance intention influenced by satisfaction, attitude, interpersonal influence and PBC.
Koufaris (2002)	TAM + flow	Online shoppers n=280	Intention to return to the online store influenced by enjoyment and usefulness; second dependent variable unplanned purcashes
Premkumar & Bhatta-cherjee (2008)	TAM/ Expectation-(dis)confirmation theory/ hybrid model (intention influenced by PU, PEOU and satisfaction)	Computer-based tutorial (e-learning) n=175 students	Integrated model offers marginally better explanatory power but gives a deeper understanding of the post-adoption process
Chea & Luo (2008)	Expectation-(dis)confirmation theory	e-services (self-selected e-service) n=97 college students	Continuance intention plus recommendation and complaint are the dependent variables. All are influenced by satisfaction, complaint is also influenced by negative effects; PU had no influence
Liao et al. (2009)	TAM + expectation-(dis)confirmation theory	e-learning students n= 626	Attitude and satisfaction are the main determinants of the IS continuance intention

Kim & Malhotra (2005)	TAM + the theory of belief updating + the self-perception theory + Habit	U.S. undergraduate students wave 1 :n= 298 in 1st round and189 in 2nd round	TAM holds true only for initial use in which neither past use nor prior evaluations can play a role. Habit is a viable predictor of future use; prior use leads to future use
Jin et al. (2010)	Extended IS continuance model	Online community members n=240	Satisfaction and affective commitment are the main drivers of continuance intention

Appendix 3 Screenshot of the online survey

Tämän kysely on osa Habbon käyttöä tarkastelevaa tutkimusta. Vastauksesi käsitellään nimettömästi. Toivomme sinun vastaavan rehellisesti ja täsmällisesti.

Emme tarjoa palkintoa, mutta tarkoituksemme on ymmärtää Habbon käyttöä ja tukea toiveitasi tulevaisuudessa. Kyselyyn vastaaminen vie alle 25 minuuttia. Voit lopettaa kyselyyn vastaamisen milloin tahansa sulkemalla sen, mikäli niin haluat. Muutoin paina "lähetä", kun olet täyttänyt kyselyn.

Jos sinulla on kysyttävää voit joko tutustua sivustoihimme (www.nuorisotutkimusseura.fi, www.tucs.fi ja www.tse.fi) tai lähettää meille sähköpostia: youth_survey(at)nuorisotutkimus.fi.

Kiitoksia vaivannäöstäsi.

1) Sukupuoli

○ Tyttö ○ Poika

2) Ikä

-Valitse-

3) Kuinka monta vuotta koulua olet käynyt?

(esim. vastaa 4, jos olet nyt 5:nnellä luokalla. Jos olet opiskellut osa-aikaisesti, muunna ko. aika täysiksi vuosiksi.

Huom. Tätä kysymystä koskevia vastauksia ei luovuteta Habbolle.

-Valitse-

4) Kenen kanssa asut?

-Valitse-

5) Mikä on taloutesi tulotaso verrattuna muihin?

(Kuinka paljon rahaa perheellä, jossa asut, on verrattuna muihin perheisiin?)

Huom. Tätä kysymystä koskevia vastauksia ei luovuteta Habbolle.

Asteikolla 1-7, jossa 1= äärimmäisen alhainen ja 7= äärimmäisen korkea

	1	2	3	4	5	6	7	
Äärimmäisen alhainen	○	○	○	○	○	○	○	Äärimmäisen korkea

6) Missä maassa asut?

-Valitse-

7) Milloin liityit mukaan Habboon?

-Valitse-

8) Mistä käsin useimmiten käytät Habboa?

-Valitse-

9) Kuulutko Habbo Clubiin?

-Valitse-

10) Miksi käytät Habboa?

Appendix 4 The survey instrument in Finnish

Item	Question
CUI1	Aion jatkaa Habbon käyttöä seuraavan kolmen kuukauden aikana.
CUI2	Aion jatkaa Habbon käyttöä säännöllisesti seuraavan kolmen kuukauden aikana.
CUI3	Tulen jatkamaan Habbon käyttöä tulevaisuudessa.
PURCH1	Aion hankkia Habbo tuotteita ja/tai Habbo Clubin jäsenyyksiä piakkoin.
PURCH2	Ennakoin, että tulen hankkimaan Habbo tuotteita ja/tai Habbo Clubin jäsenyyksiä lähitulevaisuudessa.
PURCH3	Tulen hankkimaan Habbo tuotteita ja/tai Habbo Clubin jäsenyyksiä tulevaisuudessa säännöllisesti.
PEOU1	Habbon käyttäminen kommunikoimiseen muiden kanssa on selkeää ja ymmärrettävää.
PEOU2	Navigointi Habbon käyttöliittymässä on helppoa.
PEOU3	Habbon käyttöliittymä on helppo oppia.
PU1	Habbo käyttäminen… Auttaa minua pysymään läheisessä yhteydessä kavereideni kanssa.
PU2	Auttaa minua pysymään läheisessä yhteydessä tuttavieni kanssa.
PU3	Auttaa minua kommunikoimaan helpommin tuttavieni kanssa
PU4	Auttaa minua saamaan tehokkaammin uusia ystäviä.
ENJ1	Habbon käyttäminen on nautittavaa.
ENJ2	Habbon käyttäminen on hauskaa.
ENJ3	Habbon käyttäminen on viihdyttävää.
PNS1	Kuinka moni ystävistäsi käyttää Habboa? (1=ei kukaan; 7= kaikki)
PNS2	Kuinka moni ikätovereistasi käyttää Habboa? (1=ei kukaan; 7= kaikki)
PNS3	Kuinka moni ympäristöstäsi käyttää Habboa? (1=ei kukaan; 7= kaikki)
SN1	Ihmiset joilla on vaikutusta minuun, ovat sitä mieltä, että minun pitäisi käyttää Habboa.
SN2	Minulle tärkeät ihmiset ovat sitä mieltä, että minun pitäisi käyttää Habboa.
SE1	Habbon käyttäminen itsenäisesti (ilman, että tarvitsen kenenkään apua) on minusta vaivatonta
SE2	Pystyn helposti toimimaan Habbossa itsenäisesti (ilman, että tarvitsen kenenkään apua).
SE3	Habbon käyttäminen tuntuu minusta vaivattomalta, vaikka lähelläni ei ole ketään joka kertoisi minulle mitä tehdä.
AVA1	En pääse aina käyttämään Habboa, koska vanhempani eivät anna minulle lupaa.
AVA2	En voi käyttää Habboa silloin kun haluan.
SP1	Habbossa on tunne inhimillisestä kontaktista (tuntuu että olen tekemisissä ihmisten, en koneiden kanssa).

SP2	Habbossa on mukana tunne inhimillisestä lämmöstä.	
SP3	Habbossa on mukana tunne seurallisuudesta (muut käyttäjät ovat toverillisia).	
PBC1	Minulla on tarvittava tietämys, osaaminen ja resurssit käyttää Habboa.	
PBC2	Osaan käyttää Habboa.	
PBC3	Tiedän miten Habboa käytetään.	
PBC4	Habbon käyttö on täysin minun hallinnassani.	
	Kaiken kaikkiaan, Habbon käyttäminen on…	
ATT1	Äärimmäisen huonoa	Äärimmäisen hyvää
ATT2	Äärimmäisen epätyydyttävää	Äärimmäisen tyydyttävää
ATT3	Äärimmäisen epämiellyttävää	Äärimmäisen miellyttävää
ATT4	Äärimmäisen kauheaa	Äärimmäisen ilahduttavaa

Appendix 5 Results of the principal component analysis

ENJ1	0.328	0.123	0.225	0.136	0.184	0.244	0.229	0.079	**0.699**	0.165
ENJ2	0.334	0.119	0.143	0.128	0.214	0.259	0.254	0.042	**0.746**	0.077
ENJ3	0.337	0.120	0.151	0.123	0.189	0.253	0.270	0.047	**0.734**	0.115
PU1	**0.799**	0.026	0.216	0.184	0.173	0.153	0.179	0.071	0.169	0.173
PU2	**0.840**	0.044	0.195	0.200	0.145	0.115	0.159	0.057	0.158	0.154
PU3	**0.761**	0.094	0.138	0.156	0.063	0.178	0.263	0.091	0.239	0.046
PU4	**0.832**	0.027	0.113	0.185	0.103	0.115	0.174	0.065	0.182	0.162
SP1	0.169	0.157	0.102	0.124	0.111	0.193	**0.793**	0.053	0.163	0.077
SP2	0.285	0.151	0.123	0.117	0.208	0.186	**0.738**	0.050	0.229	0.082
SP3	0.350	0.032	0.203	0.111	0.166	0.110	**0.731**	0.091	0.182	0.166
SN1	0.264	-0.005	0.189	0.303	0.078	0.113	0.166	0.174	0.131	**0.802**
SN2	0.272	-0.028	0.196	0.323	0.064	0.105	0.143	0.197	0.139	**0.787**
SE1	0.040	**0.900**	0.045	0.010	0.224	0.139	0.098	-0.037	0.056	0.001
SE2	0.054	**0.905**	0.035	-0.032	0.219	0.105	0.086	-0.039	0.078	0.002
SE3	0.033	**0.901**	0.036	-0.002	0.228	0.118	0.078	-0.037	0.079	-0.022
PEOU1	0.176	0.303	0.084	0.080	**0.768**	0.148	0.181	-0.043	0.125	0.056
PEOU2	0.150	0.242	0.121	0.076	**0.823**	0.159	0.120	0.002	0.155	0.053
PEOU3	0.096	0.314	0.132	0.078	**0.810**	0.151	0.123	0.009	0.123	0.032
AVA1	0.070	-0.105	0.161	0.168	-0.029	-0.030	0.027	**0.821**	0.016	0.130
AVA2	0.079	-0.042	0.072	0.142	-0.021	0.019	0.073	**0.869**	0.004	0.079
PNS1	0.242	-0.031	0.149	**0.793**	0.092	0.122	0.086	0.216	0.068	0.247
PNS2	0.170	0.070	0.200	**0.804**	0.069	0.076	0.137	0.139	0.171	0.111
PNS3	0.219	-0.064	0.160	**0.791**	0.074	0.120	0.094	0.226	0.035	0.170
PURCH1	0.187	0.053	**0.866**	0.156	0.100	0.176	0.120	0.123	0.093	0.123
PURCH2	0.207	0.007	**0.831**	0.191	0.119	0.182	0.118	0.151	0.106	0.140
PURCH3	0.167	0.080	**0.817**	0.168	0.116	0.248	0.133	0.076	0.162	0.081
CUI1	0.153	0.227	0.211	0.106	0.184	**0.800**	0.177	0.042	0.201	0.053
CUI2	0.235	0.128	0.327	0.135	0.183	**0.728**	0.182	0.060	0.190	0.091
CUI3	0.191	0.176	0.232	0.133	0.190	**0.743**	0.184	0.041	0.227	0.105

Varimax rotation

Appendix 6 Psychometric properties and convergent validity TAM

Item	*Mean*	*Std. Dev.*	*Loading*	*Composite reliability*	*AVE*
CUI1	5.464	1.897	0.894	0.909	0.697
CUI2	4.884	2.100	0.882		
CUI3	5.295	1.929	0.853		
PEOU1	6.256	1.412	0.833	0.895	0.689
PEOU2	5.873	1.581	0.879		
PEOU3	5.804	1.672	0.868		
PU1	4.759	2.107	0.917	0.940	0.761
PU2	4.662	2.119	0.942		
PU3	4.659	2.108	0.885		
PU4	4.890	2.029	0.823		

Appendix 7 Correlations between the constructs TAM

	PU	**PEOU**	**CUI**
PU	**0.872**		
PEOU	0.436	**0.830**	
CUI	0.553	0.577	**0.835**

Square roots of AVEs presented in the main diagonal.

Appendix 8 Psychometric properties and convergent validity UTAUT

Item	*Mean*	*Std. Dev.*	*Loading*	*Composite reliability*	*AVE*
CUI1	5.464	1.897	0.894	0.909	0.697
CUI2	4.884	2.100	0.881		
CUI3	5.295	1.929	0.854		
EE1	6.256	1.412	0.841	0.895	0.690
EE2	5.873	1.581	0.867		
EE3	5.804	1.672	0.873		
PE1	4.759	2.107	0.919	0.940	0.761
PE2	4.662	2.119	0.941		
PE3	4.659	2.108	0.886		
PE4	4.890	2.029	0.822		
SN1	3.504	2.088	0.930	0.932	0.636
SN2	3.331	2.027	0.938		
FC1	5.856	1.630	0.699	0.922	0.750
FC2	6.292	1.266	0.968		
FC3	6.43	1.254	0.970		
FC4	6.303	1.295	0.799		

According to Venkatesh et al. (2003) the construct names Effort Expectancy (EE), Peformance Expentancy (PE) and Facilitating conditions are used. The items for PEOU were used to measure EE and PU for PE. Facilitating conditions were measured with PBC.

Appendix 9 Correlations between the constructs UTAUT

	CUI	**PE**	**EE**	**FC**	**SN**
CUI	**0.835**				
PE	0.554	**0.873**			
EE	0.578	0.436	**0.830**		
FC	0.432	0.245	0.676	**0.838**	
SN	0.438	0.608	0.284	0.116	**0.797**

Appendix 10 Psychometric properties and convergent validity TPB

Item	*Mean*	*Std. Dev.*	*Loading*	*Composite reliability*	*AVE*
CUI1	5.464	1.897	0.898	0.908	0.697
CUI2	4.884	2.100	0.875		
CUI3	5.295	1.929	0.854		
ATT1	5.002	1.669	0.861	0.936	0.758
ATT2	4.447	1.601	0.859		
ATT3	5.078	1.685	0.928		
ATT4	5.113	1.716	0.892		
PU1	4.759	2.107	0.919	0.940	0.761
PU2	4.662	2.119	0.941		
PU3	4.659	2.108	0.886		
PU4	4.890	2.029	0.822		
SN1	3.504	2.088	0.905	0.928	0.634
SN2	3.331	2.027	0.955		
PBC1	6.259	1.404	0.703	0.923	0.703
PBC2	6.292	1.343	0.965		
PBC3	6.256	1.412	0.969		
PBC4	2.465	2.065	0.802		

Appendix 11 Correlations between the constructs TPB

	CUI	**ATT**	**SN**	**PBC**
CUI	**0.834**			
ATT	0.546	**0.871**		
SN	0.449	0.470	**0.796**	
PBC	0.450	0.258	0.120	**0.839**

Square roots of AVEs in the main diagonal

Appendix 12 Model fit statistics for the referent models[13]

	TAM	***UTAUT***	***TPB***
Cmin/df	5.361	3.578	3.499
GFI	0.968	0.962	0.963
NFI	0.980	0.978	0.978
RMSEA	0.065	0.050	0.052
CFI	0.984	0.984	0.984
TLI	0.977	0.979	0.98

[13] measurement models

TURUN KAUPPAKORKEAKOULUN JULKAISUSARJASSA A OVAT VUODESTA 2010 LÄHTIEN ILMESTYNEET SEURAAVAT JULKAISUT

A-1:2010 Pikka-Maaria Laine
Toimijuus strategiakäytännöissä: Diskurssi- ja käytäntöteoreettisia avauksia

A-2:2010 Juha V. Virtanen
Johtajana sairaalassa. Johtajan toimintakenttä julkisessa erikoissairaalassa keskijohtoon ja ylimpään johtoon kuuluvien lääkäri- ja hoitajataustaisten johtajien näkökulmasta

A-3:2010 Markus Vinnari
The past, present and future of eating meat in Finland

A-4:2010 Arja Lemmetyinen
The coordination of cooperation in tourism business networks

A-5:2010 Antti Fredriksson
Soft and hard information in bank-firm relationships - The effect of relationship intensity and reporting conservatism on loan pricing and relationship value

A-6:2010 Tomi Kortela
The intertemporal choice of households under incomplete markets in general equilibrium

A-7:2010 Hongxiu Li
E-service continuance: an insight into online travel services in China

A-8:2010 Harri Virolainen
"Kai sitä ihminen on vaan semmoinen laumaeläin" – Virtuaalisen tiimin ilmapiiri

A-1:2011 Marjo Kumpula
Vakuutusalan työn sisältö ja työntekijöiden ammatti-identiteetin muovautuvuus – Vakuutusvirkailijasta finanssialan myyjäksi?

A-2:2011 Helena Keinänen
Algorithms for coalitional games

A-3:2011 Matti Mäntymäki
Continuous use and purchasing behaviour in social virtual worlds

Kaikkia edellä mainittuja sekä muita Turun kauppakorkeakoulun julkaisusarjoissa ilmestyneitä julkaisuja voi tilata osoitteella:

KY-Dealing Oy
Rehtorinpellonkatu 3
20500 Turku
Puh. (02) 333 9422
E-mail: ky-dealing@tse.fi

All the publications can be ordered from

KY-Dealing Oy
Rehtorinpellonkatu 3
20500 Turku, Finland
Phone +358-2-333 9422
E-mail: ky-dealing@tse.fi