

# Why People Buy Virtual Items in Virtual Worlds with Real Money

**Yue Guo**

University of East Anglia

**Stuart Barnes**

University of East Anglia

## **Abstract**

*Virtual worlds, such as Second Life and Everquest, have grown into virtual game communities that have economic potential. In such communities, virtual items are bought and sold between individuals for real money. The study detailed in this paper aims to identify, model and test the individual determinants for the decision to purchase virtual items within virtual game communities. A comprehensive understanding of these key determinants will enable researchers to further the understanding of player behavior towards virtual item transactions, which are an important aspect of the economic system within virtual games and often raise one of the biggest challenges for game community operators. A model will be developed via a mixture of new constructs and established theories, including the theory of planned behavior (TPB), the technology acceptance model (TAM), trust theory and unified theory of acceptance and use of technology (UTAUT). For this purpose the research uses a sequential, multi-method approach in two phases: combining the use of inductive, qualitative data from focus groups and expert interviews in phase one; and deductive, quantitative survey data in phase two. The final model will hopefully provide an impetus to further research in the area of virtual game community transaction behavior. The paper rounds off with a discussion of further research challenges in this area over the next seven years.*

**ACM Categories:** K.4.0, K.4.4, J.M, H.4.0

**Keywords:** Model, MMORPG, MMOG, Transactions, Virtual Game, Virtual Items, Virtual World

## **Research Objective**

Virtual game communities are considered one of the most promising online game models—integrating traditional computer games into the context of collaborative virtual environments. Such games may be more structured (e.g., World of Warcraft, Everquest, or Ultima Online), or more organic in their design (e.g., Second Life, There, and The Sims Online). Thousands of participants may not only interact with one another, but may also buy and sell virtual items in a virtual community. Accordingly, a market has emerged for so-called ‘virtual assets.’ Virtual assets are intangible valuables that exist solely in the computer systems known as virtual worlds—elements that may have a significant role in improving the overall competence or appearance of the characters owned by a player, such as items (e.g., weapons or clothing), or virtual currencies. Elements constituting to the overall numerical competence of the character are the artefacts and wealth the player acquires for the character, (Manninen & Kujanpää, 2007, p. 26).

Such goods are bought and sold using real money. According to DFC Intelligence (2005), the revenue from trading virtual assets in virtual game communities will reach \$1.8 billion by 2009.

Much of the current research on virtual game communities takes a descriptive and conceptual approach (MacInnes, Park, & Whang, 2004; Manninen & Kujanpää, 2007) as is typical of a research domain in the early stages of development. So far, no study has attempted to identify, model and test the individual determinants for the decision to purchase virtual items within virtual game communities.

## Relevant Literature

Rapid development of virtual worlds and virtual game communities has fostered growing concern about the trade of virtual items for real money. (Edward, 2006, p. 53; Jun-Sok, 2006; MacInnes et al., 2004; MacInnes, 2005; Manninen & Kujanpää, 2007, p. 30; Starodoumov, 2005).

At present, most virtual game communities are based on a massively multiplayer online role-playing game (MMORPG) model. In a MMORPG, thousands of participants are able to interact with each other as well as with computer-controlled creatures or non-player characters (NPCs) by assuming different personae (e.g., warrior, mage, priest or thief). The games are continuous, and players can accumulate their own features in virtual game communities. In addition, similar to the real world, members may participate in buying and selling virtual items through virtual community currencies, which have constructed virtual economic systems in some cases and further resulted in a significant impact on the real economic system. For example, a considerable number of players actively participate in virtual item transactions through virtual game communities, such as Second Life, as well as some C2C e-business websites, such as eBay. Furthermore, the growing demand for trading virtual items has also resulted in the emergence of professional C2C virtual item transaction websites, which offer secure transaction mechanisms for the trade of virtual items for real money, such as ItemBay ([www.itembay.com](http://www.itembay.com)).

Several important theoretical models have been used for analyzing the factors that influence consumer online purchasing behavior, such as the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975), the theory of planned behavior (TPB) (Ajzen, 1991), the technology acceptance model (TAM) (Davis, 1989), trust theory (McKnight, Choudhury, & Kacmar, 2002) and the unified theory of acceptance and use of technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003).

## Why Do People Buy?

The principal research question of this research is: "What are the determinants of members' behavioral intentions with respect to virtual item<sup>1</sup> transactions in virtual worlds?"

### The Reasoned Action of Theory (TRA)

Fishbein and Ajzen (1975) suggested that an individual's behavioural intention is jointly determined by two independent constructs, attitude towards the behaviour and subjective norms.

The former refers to the individual's positive or negative feelings about performing a specific behavior (e.g. using a new technology), while the latter is defined as the degree to which an individual perceives that important others believe he or she should perform a given behavior. Numerous empirical tests have shown that the theory of reasoned action is a remarkably robust model for explaining human behavior in a wide variety of settings. As the first influential theoretical model of human behavior, TRA has been frequently used as a theoretical foundation of subsequent prominent models, such as TPB (Ajzen, 1991) and TAM (Davis, 1989).

### Theory of Planned Behavior (TPB)

To overcome the major application limitation of TRA—that ignores an individual's volitional control on his or her behaviour—Ajzen (1991) extended the TRA model by introducing a new construct, perceived behavioural control, which led to the theory of planned behaviour (TPB). The TPB model suggests that an individual's intention for actual behavior is jointly determined by three constructs: attitude toward the behavior, subjective norms and perceived behavioral control. Ajzen defined perceived behavioral control as one person's perceptions of how easy or difficult it is to perform specific behavior based on his or her ability (i.e., internal factors) or resources (i.e., external factors) (1991, p. 183). For example, when purchasing an expensive virtual item, consumers not only need precise information resources, but must also have enough confidence in their judgment about the transaction behavior. Additionally, Ajzen (1991) argued that perceived behavioral control also has a direct link with actual behavior if perceived behavioral control, to some extent, is consistent with actual behavioral control (p. 184).

---

<sup>1</sup> Virtual items are digital constructs created within virtual worlds, which may refer to entirely new characters, weapons, outfits and so on.

## Technology Acceptance Model (TAM)

Davis (1989) adapted the TRA to specifically predict and explain the acceptance of new technologies. The result was the technology acceptance model (TAM). In the technology acceptance model perceived usefulness (PU) and perceived ease of use (PEU) are two core beliefs determining an individual's behavioral intention towards new technology usage. The former is defined as "the extent to which a person believes that using the system will enhance his or her job performance", while the latter refers to "the extent to which a person believes that using the system will be free of effort" (Davis, 1989, p. 320).

It is worth noting that the TRA's key construct "attitude toward the behavior" was excluded from their final model (Davis, Bagozzi, & Warshaw, 1989, p. 995) because an individual's attitude cannot always completely determine his or her behavioral intention, especially in task-oriented behavior. For example, in this case, some players possibly dislike buying virtual items by using virtual community transaction mechanisms. However, for improving the overall competence of their characters, they are still motivated to buy virtual items in virtual worlds. Furthermore, TAM suggests that external factors (e.g., system quality) only have indirect influence on behavioral intention through beliefs (i.e., perceived usefulness and perceived ease of use).

## Web Trust Model

McKnight, Choudhury, and Kacmar (2002) applied a multidimensional model of trust to the context of e-commerce. They contended that trust-related behavior can be directly influenced by one's trust intention according to the TRA model. Trust intention refers to one person's willingness to depend on another (McKnight, Cummings, & Chervany, 1998, p. 474). It demonstrates one person's intention to engage in trust-related behavior, which is similar to the construct, behavioral intention, used by other theoretical models (e.g., TAM). Furthermore, one's trust intention is jointly determined by three constructs, disposition to trust, institution-based trust and trust beliefs. Among these three constructs, disposition to trust refers to one person's tendency to be willing to depend on others (McKnight et al., 1998, p. 474). It describes an individual's intrinsic personality traits (Kim & Kim, 2005, p. 5). Institution-based trust means the degree to which one person believes structural conditions are good enough to support his or her success (McKnight et al., 1998, p. 474). Trust beliefs can be defined as a member's confidence that the trade partner will fulfill his or her transactional obligations as expected by the member (Kim & Kim, 2005, p. 5). In the web trust model, trust beliefs are

directly determined by both the disposition to trust and institution-based trust.

Note that McKnight et al.'s (2002) web trust model does not include the influence of familiarity on trust-related behavioral intention. However, familiarity has been found to have a significant influence on trust-related behavioral intention (Walczuch & Lundgren, 2004; Gefen, 2000; Bhattacharjee, 2002). Specifically, Walczuch and Lundgren (2004) identified familiarity as another important antecedent of trust beliefs. Familiarity is defined as "one's understanding of another's behavior based on prior interactions or experiences" (Bhattacharjee, 2002, p. 220). It describes the understanding of one person's current behavior based upon past interaction, while trust deals with beliefs about further behavior (Gefen, 2000, p. 727). Apparently, an individual's past behavior should have a strong influence on others' perceptions of further behavior. Bhattacharjee suggest that successful transactions always contribute to the impulsiveness of further transaction activities without a careful assessment of the present ability, benevolence, and integrity of the opposite party (2002, p. 221). Thus, in this research, familiarity is added to the web trust model to provide a more complete understanding of trust-related behavior. The full model is labeled the augmented web trust model.

## Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. (2003) proposed the unified theory of acceptance and use of technology (UTAUT) model by reviewing and consolidating eight representative user acceptance models. The eight prominent models are the TRA, TAM, TPB, Decomposed TPB (DTPB) (Taylor & Todd, 1995), motivational model (MM) (Davis, Bagozzi, & Warshaw, 1992), model of PC utilization (MPCU) (Thompson, Higgins, & Howell, 1991; Triandis, 1977), innovation diffusion theory (IDT) (Rogers, 1995), and social cognitive theory (SCT) (Bandura, 1986; Compeau & Higgins, 1995a; Compeau & Higgins, 1995b; Compeau, Higgins & Huff, 1999). They aimed at integrating critical constructs across the eight models into a structural model thereby providing a more powerful explanation of the user acceptance of information technology in various situations than any individual model. Venkatesh et al. (2003) identified performance expectancy, effort expectancy, and social influence as three significant direct determinants of behavioral intention, which are all related to this research.

Specifically, performance expectancy is defined as "the degree to which an individual believes that using the system will help him or her to attain gains in [job] performance" (Venkatesh et al., 2003, p. 447). Its

direct effect on behavioral intention has been consistently shown in previous technology acceptance models adopting similar constructs, such as perceived usefulness in TAM and DTPB. Effort expectancy is defined as “the degree of ease associated with the use of the system” (Venkatesh et al., 2003, p. 450). The effort expectancy construct unifies three conceptually and empirically similar determinants of behavioral intention across three existing models including perceived ease of use (TAM), complexity (MPCU) and ease of use (IDT). Social influence, as defined by UTAUT, is “the degree to which an individual perceives that important others believe he or she should use the new system” (Venkatesh et al., 2003, p. 451). Three existing constructs capture the concept of social influence: subjective norms in TRA, TPB and DTPB, social factors in MPCU and image in IDT.

### **Preliminary Research Model**

Based on the review of influential theoretical models above, a preliminary research model has been formulated. Ten constructs appear to be significant determinants that influence players’ virtual item transactions within virtual game communities. Among them, seven constructs are adapted from existing theoretical models including performance expectancy, effort expectancy, social influence, perceived critical mass, trust (composite), perceived enjoyment and behavioral intention (BI). These seven constructs are refined to predict and explain virtual item transaction behavior within virtual game communities. Additional constructs, such as perceived virtual game community (VGC) quality, perceived information asymmetry and character competency are added into the model for capturing all new antecedents that predict and explain players’ transaction behavioral intention in the context of virtual communities.

### **Behavioral Intention**

Behavioral intention is defined as an individual’ own estimated probability that he or she will participant in virtual item transactions within virtual game communities. In this research, we focus on behavioral intention to participate in virtual item transactions within virtual game communities rather than actual participation owing to the following two reasons. First, much previous research has demonstrated that behavioral intention seems to be a significant direct determinant of actual behavior and the influence of other factors on actual behavior may be fully mediated by behavioral intention. Secondly, researchers still cannot find valid and reliable measures of actual behavior in the social sciences.

### **Performance Expectancy and Effort Expectancy**

Performance expectancy is defined as the degree to which a player believes that using virtual community transaction mechanisms will help in improving character competence in virtual game communities, while effort expectancy refers to the degree of ease associated with the use of virtual community transaction mechanism. A virtual community’s transaction mechanisms are, in essence, complex information systems. Hence, we believe that the two constructs, performance expectancy and effort expectancy, are still suitably used as key determinants for predicting members’ transaction behavioral intention in the context of virtual communities.

### **Social Influence**

After revising Venkatesh et al.’s (2003) definition of social influence, in this research, it refers to the degree to which an individual perceives that important others believe he or she should use community transaction mechanisms to gain high-level virtual items for enhancing character competence. We expect that social influence is still a strong predictor of players’ behavioral intention to purchase virtual items through community transaction mechanisms especially for those that are new to virtual game communities.

### **Character Competence**

According to Kim, Oh and Lee, a player will be far too immersed in a virtual game community (experience flow) if he or she has achieved matching skills (e.g., advanced weapons) against other players’ challenges (2005, p. 80). Specifically, high character competence (low challenge) will diminish a player’s desire to further attain even advanced virtual items as his or her characters’ overall competence will already be superior to that of others, and vice versa. In addition, with the increase in the overall competence of the characters owned by a player, he or she may prefer to challenge advanced computer-controlled players for gaining a great sense of achievement. Therefore, the construct, character competence, appears to be significant for predicting players’ virtual item purchase behavioral intention.

### **Perceived Enjoyment**

Davis et al. (1992) extended the original TAM model and supplemented the construct, perceived enjoyment, which is an important intrinsic motivation behind the adoption of new technologies. The augmented relationship is in line with subsequent empirical studies (Van der Heijden, 2003; Moon & Kim, 2001; Cheong & Park, 2005; Teo, Lim, & Lai,

1999), which obtained the significant direct influence of perceived enjoyment on an individual's intention towards the use of information systems, such as websites and the mobile Internet. Note that, in this research, perceived enjoyment is defined as the extent to which fun can be derived from participating in virtual game communities instead of using virtual item transaction mechanisms (systems). We believe that when a player perceives that participation in a virtual game community is an enjoyable experience, he or she will have an incentive to purchase virtual items for improving character competence thereby possibly using virtual item transaction mechanisms. Therefore, we suggest that perceived enjoyment should significantly influence a member's behavioral intention towards participating in virtual item transactions within virtual game communities.

### **Trust (Composite)**

In this preliminary research model, we adopt the trust (composite) construct to capture all trust-related factors (i.e., disposition to trust, institution-based trust, trust beliefs and familiarity) that influence players' transaction behavioral intention. We believe that these trust constructs are still likely to be key determinants in the context of virtual communities because trust constructs strongly relate to a member's decision making on his or her behavior associated with risks and uncertainties. Furthermore, the nature of risks and uncertainties faced by a person in both web-based platforms and virtual item transactions within virtual game communities is usually parallel.

### **Perceived Information Asymmetry**

In the proposed research model, we employ a new construct, perceived information asymmetry, to demonstrate the influence of resource facilitation conditions. The construct is defined as the perception of whether or not an individual lacks enough information resources to perform intended behavior. As an example, a player possibly has a strongly behavioral intention towards trading virtual items within virtual game communities. However, he or she may still hesitate to complete a final transaction decision due to the lack of enough market information to judge whether the transaction price is reasonable. Therefore, this research employs the construct perceived information asymmetry as an inhibiting factor to capture the effect of resource facilitation conditions on players' virtual item transaction behavioral intention.

### **Critical Mass**

A considerable amount of literature has investigated the role of critical mass in the adoption of new information technologies. Hsu and Lu suggested that perceived critical mass has a significant influence on users' attitude towards the acceptance of a new system or technology, such as email (2004, p. 857). Critical mass is defined as "the minimal number of adopters of an interactive innovation for the further rate of adoption to be self-sustaining" (Mahler & Rogers, 1999, p. 721). In this research, the construct, perceived critical mass, denotes the extent to which a person believes that most members will purchase virtual items through community transaction platforms. In a virtual game community, if a member has realized that numerous players have successfully bought or sold virtual items through the virtual community's transaction mechanisms, he or she will have a high behavioral intention towards participating in virtual item transactions within the virtual game community.

### **Perceived Virtual Game Community Quality**

A large number of studies have employed information systems (IS) quality as an effective predictor of information systems usage (Delone & McLean, 1992; Lin & Lu, 2000; Cheong & Park 2005). For example, Delone and Mclean (1992) identified information quality and system quality as two important factors related to the successful adoption of IS. Information quality focuses on measuring the quality of IS output, while system quality considers system performance itself. Similarly, Lin and Lu (2000) applied TAM to understanding customers' behavioral intention to use a website and employed IS quality as an external determinant of TAM's two core constructs, perceived usefulness and perceived ease of use. Lin and Lu's (2000) IS quality construct includes three dimensions, information quality, response time, and system accessibility. The latter two really demonstrate two different attributes of system performance.

On the basis of these existing studies, our preliminary research model employs the construct, perceived VGC quality to capture the concept of IS quality in the context of virtual communities. Furthermore, this construct includes two dimensions, community transaction system quality and game content quality. The former is modelled as a direct determinant of performance expectancy and effort expectancy according to TAM, while the latter is used as a useful predictor of perceived enjoyment. In general, in a virtual game community with more informative and amusing contents, players are more likely to experience enjoyment and playfulness.

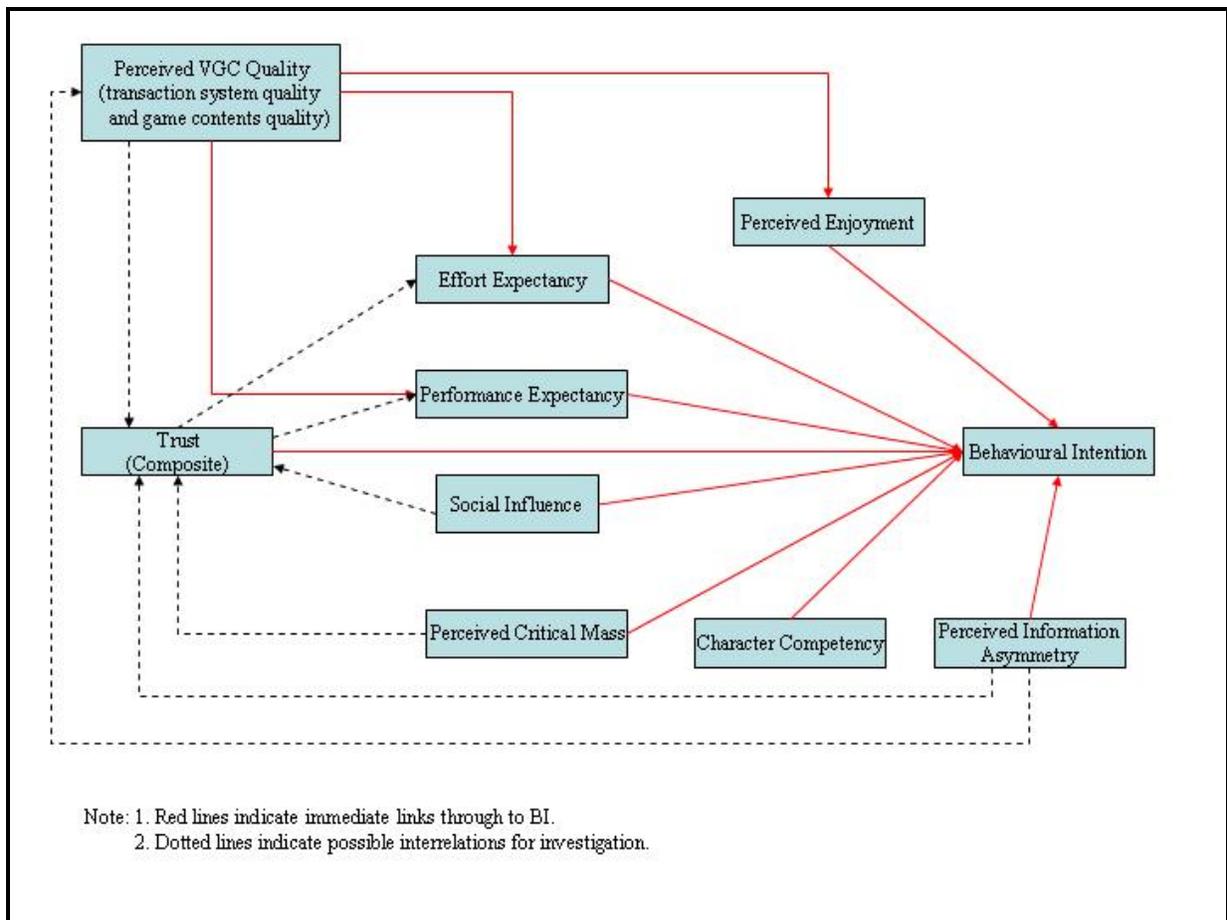


Figure 1. A Possible Preliminary Research Model.

## Expected Outcomes

The suggested model tries to further understanding of latent psychological processes that induce transaction behavior and that may to some extent be generalized. In particular, the research will identify the determinants that are most relevant to understanding transaction behavior in the context of virtual game communities. The likely outcome from testing the final model will be an extension to existing behavioral theories (e.g., TAM, TPB) via new constructs validated in the virtual game community domain. The model will hopefully provide an impetus to further research in the area of virtual game community transaction behavior.

## Research Agenda from 2007 to 2015

There are many areas for potential research over the next 7 years, including:

- understanding the emerging business models and dynamics of the economic system for virtual item transactions in virtual worlds;
- the implications of virtual economic systems

in real economic terms, including the revenue and employment implications of this new channel; and

- the management of virtual assets. Several issues should be further studied, such as the seamless integration of transaction data between real and virtual economic systems, and the taxation policy on trading virtual assets (Leandra, 2007).

These three potential research areas are closely related. Specifically, the first suggested research area may provide a preliminary conceptual foundation for understanding of the real money trade of virtual assets in virtual worlds from the conceptual perspective.

## References

- Ajzen, I. (1991). "The Theory of Planned Behavior," *Organizational Behavior and Human Decision Processes*, Vol. 50, No.2, pp. 179-211.
- Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*, Englewood Cliffs, NJ: Prentice Hall.
- Bhattacharjee, A. (2002). "Individual Trust in Online

- Firms: Scale Development and Initial Test," *Journal of Management Information Systems*, Vol. 19, No.1, pp. 211-241.
- Compeau, D.R., and Higgins, C.A. (1995a). "Application of Social Cognitive Theory to Training for Computer Skills," *Information Systems Research*, Vol. 6, No.2, pp. 118-143.
- Compeau, D.R., and Higgins, C.A. (1995b). "Computer Self-Efficacy: Development of a Measure and Initial Test," *MIS Quarterly*, Vol. 19, No.2, pp. 189-211.
- Compeau, D.R., Higgins, C.A., and Huff, S. (1999). "Social Cognitive Theory and Individual Reactions to Computing Technology: A Longitudinal Study," *MIS Quarterly*, Vol. 23, No.2, pp. 145-158.
- Cheong, J.H., and Park, M.C. (2005). "Mobile Internet Acceptance in Korea," *Internet Research*, Vol. 15, No.2, pp. 125-140.
- Davis, F.D. (1989). "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly*, Vol. 13, No.3, pp. 319-339.
- Davis, F.D., Bagozzi, R.P., and Warshaw, P.R. (1989). "User Acceptance of Computer Technology: A comparison of Two Theoretical Models," *Management Science*, Vol. 35, No.8, pp. 982-1003.
- \_\_\_\_\_. (1992). "Extrinsic and Intrinsic Motivation to Use Computers in the Workplace," *Journal of Applied Social Psychology*, Vol. 22, No.14, pp. 1111-1132.
- DeLone, W., and McLean, E. (1992). "Information Systems Success: The Quest for the Dependent Variable," *Information Systems Research*, Vol. 3, No.1, pp. 60-95.
- DFC Intelligence (2005). "The Growing Customization of Games Could Expand Revenue Opportunities," *Game Articles*, Retrieved April, 2007, from [http://www.dfcint.com/game\\_article/apr05article.html](http://www.dfcint.com/game_article/apr05article.html).
- Edward, C. (2006). "A Cost-Benefit Analysis of Real-Money Trade in the Products of Synthetic Economies," *Info*, Vol. 8, No.6, pp. 51-68.
- Fishbein, M., and Ajzen, I. (1975). *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*, Reading, MA: Addison-Wesley.
- Gefen, D.W. (2000). "E-commerce: the Role of Familiarity and Trust," *The International Journal of Management Science*, Vol. 28, No.6, pp. 725-737.
- Hsu, C.L., and Lu, H.P. (2004). "Why Do People Play On-line Games? An Extended TAM with Social Influences and Flow Experience," *Information and Management*, Vol. 41, No.7, pp. 853-868.
- Jun-Sok, H. (2006). "Effects of Real-Money Trading on MMOG Demand: A Network Externality Based Explanation," *Social Science Research Network*, Retrieved April, 2007, from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=943368](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=943368).
- Kim, Y., Oh, S., and Lee, H. (2005). "What Makes People Experience Flow? Social Characteristics of Online Games," *International Journal of Advanced Media & Communication*, Vol. 1, No.1, pp. 76-92.
- Kim, Y.H., and Kim, D.J. (2005). "A Study of Online Transaction Self-Efficacy, Consumer Trust, and Uncertainty Reduction in Electronic Commerce Transaction," *Proceedings of the 38th Hawaii International Conference on System Sciences*, Waikoloa, Hawaii, pp. 1-11.
- Liang, T., and Huang, J. (1998). "An Empirical Study on Consumer Acceptance of Products in Electronic Markets: A Transaction Cost Model," *Decision Support Systems*, Vol. 24, No.1, pp. 29-43.
- Leandra, L. (Forthcoming). "'Stranger than Fiction': Taxing Virtual Worlds," *New York University Law Review*, Vol.82.
- Lin, J.C., and Lu, H. (2000). "Towards An Understanding the Behavioral Intention to Use A Web Site," *International Journal of Information Management*, Vol. 20, No.3, pp. 197-208.
- MacInnes, I., Park, Y., and Whang, S. (2004). "Virtual World Governance: Digital Item Trade and Its Consequences in Korea," *Proceedings of the 32th Annual Telecommunications Policy Research Conference*, Arlington, VA, pp. 1-21.
- MacInnes, I. (2005). "Virtual Worlds in Asia: Business Models and Legal Issues," *Proceedings of DiGRA Conference: Changing Views – Worlds in Play*, Vancouver, Canada, pp. 1-10.
- Manninen, T., and Kujanpää, T. (2007). "The Value of Virtual Assets – The Role of Game Characters in MMOGs," *International Journal of Business Science and Applied Management*, Vol. 2, No.1, pp. 21-33.
- Mahler, A., and Rogers, E.M. (1999). "The Diffusion of Interactive Communication Innovations and the Critical Mass: The Adoption of Telecommunications Services by German Banks," *Telecommunications Policy*, Vol. 23, No.10, pp. 719-740.
- McKnight, D.H., Cummings, L.L., and Chervany, N.L. (1998). "Initial Trust Formation in New Organizational Relationships," *The Academy of Management Review*, Vol. 23, No.3, pp. 473-490.
- McKnight, D.H., Choudhury, V., and Kacmar, C. (2002). "Developing and Validating Trust Measures for E-commerce: An Integrative Typology," *Information System Research*, Vol. 13, No.3, pp. 334-359.
- Moon, J., and Kim, Y. (2001). "Extending the TAM for World-Wide-Web context," *Information and Management*, Vol. 38, No.4, pp. 217-30.

- Rogers, E. (1995). *Diffusion of Innovations*. New York: Free Press.
- Starodoumov, A. (2005). "Real Money Trade Model in Virtual Economies," *Social Science Research Network*, Retrieved June, 2007, from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=958286](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=958286).
- Taylor, S., and Todd, P.A. (1995). "Understanding Information Technology User: A Test of Competing Models," *Information Systems Research*, Vol. 6, No.2, pp. 144-176.
- Teo, T.S.H., Lim, V.K.G., and Lai, R.Y.C. (1999). "Intrinsic and Extrinsic Motivation in Internet Usage," *Omega: International Journal of Management Science*, Vol. 27, No.1, pp. 25-37.
- Thompson, R.L., Higgins, C.A., and Howell, J.M. (1991). "Personal Computing: Toward a Conceptual Model of Utilization," *MIS Quarterly*, Vol. 15, No.1, pp. 124-143.
- Triandis, H.C. (1977). *Interpersonal Behavior*. Monterey, CA: Brooks/Cole.
- Van der Heijden, H. (2003). "Factors Influencing the Usage of Websites: the Case of a Generic Portal in the Netherlands," *Information and Management*, Vol. 40, No.6, pp. 541-549.
- Venkatash, V., Morris, M.G., Davis, G.B., and Davis, F.D. (2003). "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly*, Vol. 27, No.3, pp. 425-478.
- Walczuch, R., and Lundgren, H. (2004). "Psychological Antecedents of Institution-based Consumer Trust in E-retailing," *Information and Management*, Vol. 42, No.1, pp. 159-177.

## About the Authors

**Yue Guo** is a doctoral candidate in the Norwich Business School at the University of East Anglia, United Kingdom. He previously served as a system engineer at Chinese Academy of Sciences, Beijing, China. His current research interests focus on psychological and relational processes involved in the individuals' virtual item transaction behavior in virtual worlds.

**Stuart J. Barnes** is Chair and Professor of Management in the Norwich Business School at the University of East Anglia, UK. He holds a PhD in Business Administration. His primary research interests centre on the successful utilization of new information and communications technologies by businesses, governments and consumers. He has published five books and more than a hundred papers.