Why Do People Abandon Mobile Social Games? Using Candy Crush Saga as an Example

Pei-Shan Wei, Szu-Ying Lee, Hsi-Peng Lu, Jen-Chuen Tzou, Chien-I Weng

Abstract—Mobile social games recently become extremely popular, spawning a whole new entertainment culture. However, mobile game players are fickle, quickly and easily picking up and abandoning games. This pilot study seeks to identify factors that influence users to discontinuing playing mobile social games. We identified three sacrifices which can prompt users to abandon games: monetary sacrifice, time sacrifice and privacy sacrifice. The results showed that monetary sacrifice has a greater impact than the other two factors in causing players to discontinue usage intention.

Keywords—Abandon, Mobile devices, Mobile social games, Perceived sacrifice.

I. INTRODUCTION

THE online social networks, smartphones and tablet computers have penetrated all spheres of our daily activities and changed people's lives and behavior. Mobile social games converge mobile and social technologies to satisfy players' needs for entertainment, diversion, and relaxation, and have increased dramatically in popularity in recent years. Mobile social games are simple and easy to play and are often integrated into social networking sites (SNS) or social communication services, allowing players to easily invite their friends to join a game for collaboration or competition, thus maintaining and strengthening their existing friendships. Many players find playing these interactive games with friends to be more fun than single-player games. Strategy Analytics, a consultancy group, predicts that the number of mobile game users will increase by 57 percent, from 532.1 million users in 2010 to 835.7 million in 2015[1]. The mobile social games industry is highly competitive with new titles released daily.

Playing online games has become a key leisure activity, leading many researchers to discussed factors which contribute to intention to play such games. Most frequently referred motivations for playing online games include entertainment, competition, challenge, curiosity, fantasy/role-playing, escape from real life, social interaction, and passing time [2]-[6].

Pei-Shan Wei is a Ph.D. candidate with the Department of Information Management, National Taiwan University of Science and Technology, Taipei City, Taiwan (Corresponding author Phone: +886-2-2737-6764; Fax: +886-2-2737-6777; e-mail: melodyps@gmail.com).

Szu-Ying Lee was a MBA student with the National Taiwan University of Science and Technology.

Hsi-Peng Lu is a Professor of Information Management with the National Taiwan University of Science and Technology.

Jen-Chuen Tzou is a Postdoctoral Fellow with the Department of Information Management, National Taiwan University of Science and Technology.

Chien-I Weng is a Ph.D. candidate with the Department of Information Management, National Taiwan University of Science and Technology.

Mobile applications, known as apps, are small programs that run on mobile devices and perform tasks ranging from web browsing to social networking and gaming. According to Nielsen, games are the most popular app category, followed by weather, navigation, and social networking [7]. Moreover, gaming apps account for the majority of industry growth, followed by social networking apps [8]. However, despite the growing popularity of mobile social games, little is understood about factors driving player enthusiasm.

Mobile gaming apps are generally free to play, but generate revenue indirectly through advertising or directly by selling premium game play items to players. Maintaining game popularity and retaining the "eyeballs" of certain demographics is critical for attracting advertisers [9]. Simple and inexpensive authoring tools make apps easy and inexpensive to produce, and the market is characterized by massive duplication and redundancy. If a player is not satisfied with a particular mobile social game, he/she can easily and freely switch to another, and factors which contribute to a loss of intention to continue usage are poorly understood. This study explores which sacrifices might induce players to discontinue playing a game.

II. CONCEPTUAL BACKGROUND AND HYPOTHESES

A. Mobile Social Games

The rapid rise of smartphones and connected mobile devices has created a new type of hardware platform for social gaming. Social network games refer to game applications that are embedded within social network sites or social communication services such as Facebook or LINE. According to Hou, the term 'social games' refers to game applications that are designed to be enjoyed and shared with friends through existing social networks and are different from other computer games in that they involve multiple players, use real-name identities, and are casual games characterized by simple rules and lack of long-term user commitment [10]. In our study, mobile social games are defined as casual games which serve as hedonic systems for entertainment on portable devices with friends in existing social networks.

Unlike traditional video games, which have rich graphics and sound, gaming apps are much simpler and cost less to develop. For example, a handful of designers can produce a marketable app in 12 weeks, at a cost of between US$10,000 to $250,000 as opposed to $2 million to $3 million for a conventional console or PC game [11]. Thus, anyone with access to the required technical skills can produce a game app. The mobile app industry is continuing to expand at a tremendous pace, attracting huge amount of investment into social networks and social gaming. Past studies have focused

primarily on online social games played on personal computers and have largely ignored mobile games. Recently, Wei and Lu examined the needs and motivations of mobile social game players, finding that both network externalities and individual gratification significantly influence intention to play social games on mobile devices, while time flexibility has relatively little impact [9].

With the vast number of apps and games available for download, mobile users can be fickle, switching from one app to another. Generally speaking, about 40 percent of downloaded apps are deleted within the first 2 or 3 weeks of use. Gaming apps may be retained a bit longer if the user finds them engaging. Most users eventually lose interest in most apps and delete them [12], and mobile gamers eventually tend to get bored playing a particular game. For instance, in March 2012, the social drawing app Draw Something was attracting 3,000 uploaded drawings every second, and generated $250,000 in daily revenue. However, the game's user-base dropped by more than 3 million users within two months of the publisher OMGPop being acquired by Zynga for US$180 million. In 2013, Zynga laid off the entire OMGPop staff, and Draw Something today has very few users [13]. In another example, King Digital Entertainment released Candy Crush Saga in November 2012 and quickly emerged as the world's most popular mobile game. However, according to GuruFocus.com, a recent dip in revenues clearly indicates that Candy Crush Saga's best days are behind it, and the decline will likely continue [14].

B. Why Do People Abandon Mobile Social Games?

Every day, over 50 million mobile apps are downloaded, but 95% are abandoned within a month. So, after getting the user to download the app, the publisher's next challenge is to ensure that he or she continues to use it. Thus publishers are forced to shift their focus from acquiring new users to retaining existing ones, raising the importance of determining how to best keep users engaged.

Perceived value has been verified to have a positive influence on satisfaction and loyalty in various contexts [15], [16]. Perceived value is an evaluation of the benefit of a product/service, determined by a consumer's perception of what is received and given [17]. Buyers' perceptions of value represent a tradeoff between the quality and benefits they perceive in the product relative to the sacrifice they perceive as making in terms of price or others costs [18]. Value is thus determined subjectively by the buyer rather than objectively by the seller. The seller can enhance the product value by enhancing product benefits or reducing its price [19].

However, Lapierre et al. revealed that customers believe that what they give, in terms of both monetary and nonmonetary costs, is more important than what they get in return [20]. Consequently the current pilot study does not include perceived benefits and focuses exclusively on the sacrifices users perceive themselves as making in the act of playing mobile social games.

C. Perceived Sacrifice

Perceived sacrifice refers to what the customers give up to engage with a product or service, can be divided into monetary and non-monetary sacrifices, where non-monetary sacrifices usually refer to effort and time [20]. Dodds and Monroe measured perceived monetary sacrifice, that is, the amount that must be paid to acquire the product/service [21]. Non-monetary sacrifices represent other losses perceived by the consumer when buying and using a product/service. Time costs, search costs and psychological costs often factor into a user's determination of whether or not to buy or re-buy a service, and may at times eclipse monetary sacrifices in importance [22]. In terms of the usage of information technology, sacrifices mainly involve the effort required to learn how to operate a given system [23], [24].

Time sacrifice entails the amount of time a consumer must spend on finding, purchasing or consuming a product/service [25]. Waiting times to acquire a service are nearly always longer and less predictable than waiting times to buy goods. Service providers cannot completely control the number of customers or the length of time it will take for each customer to be served. For users of online games, passing a level can be seen as a type of service. Many online games feature multiple levels of increasing difficulty. Many users will give up and abandon the game once it becomes too challenging. Lee et al. also found that users will cite wasted time as a reason for avoiding social network games [28]. In the current study, perceived time sacrifice occurs when players consider playing mobile social game to be a waste of time or that they're investing too much time to pass a difficult hard level. Thus this study proposes the following hypothesis:

H1. Perceived time sacrifice for playing mobile social games will leave users more likely to stop playing.

Monetary sacrifice is defined as monetary costs perceived by the consumer (e.g., if the consumer find the cost of the product/service to be higher than expected, he/she must determine whether the sacrifice is justified) [25]. To increase distribution, mobile social games are generally free to download, but some virtual goods for use within the game are available for purchase [26]. For instance, Candy Crush Saga is a free app, but players can purchase in-game upgrades for extra moves, more lives, or more levels. The game's financial success lies in balancing monetary sacrifice with high engagement, encouraging users to buy an upgrade to be able to beat their friends' scores. The in-app purchase mechanism is easy to use, and many players make multiple purchases. However, purchasing a premium item does not guarantee that the user can pass a frustrating level. Also, spending real money on in-game app purchases can feel unreal until the user's monthly bill arrives with a surprise. Past research has indicated that different people have a varying level of tolerance for monetary sacrifice [27]. In the current study, perceived monetary sacrifice indicates that the user finds the in-app purchase to be unjustifiable. Hence the following hypothesis is proposed:

H2. Perceived money sacrifice in mobile social games will leave users more likely to abandon the game.

While mobile social games offer a new range of opportunities for user entertainment and experience, privacy and security have emerged as major concerns [29]. Before playing any game connected to an SNS (e.g., Facebook or LINE), the user must 'allow' the application to access their SNS profile and all the information contained within it. Controversially, the Terms of Use to which users must agree often contain clauses permitting social networking operators to record all personal information and interactions, retain them for potential use in social data mining, or even share it with third parties. In addition, for players to achieve high scores, social entertainment applications require users to invite a considerable number of friends and supporters to play the same game, turning the user's friends into resources, not only for the player, but also for the game developer, who relies on this 'network effect' to make the game go viral. Some users have complained about this practice as they may not wish for all of their contacts be aware of their online behavior [30]. Shin and Shin indicated that users have concerns about the vulnerability of social network game security and privacy breaches when they play social network games [31]. Lee et al. also found that respondents would avoid playing social network games because of the annoying notifications they received about their friends' game activity through a shared SNS [28]. In the current study, perceived sacrifice of privacy occurs when players perceived a risk to personal privacy through a social network platform or annoyance from friends' gaming activity notifications or invitations. Thus this study proposes the following hypothesis:

H3. Perceived privacy sacrifice from playing mobile social game will make users more likely to stop playing.

After reviewing the relevant literature, we developed our research model. Fig. 1 presents the model and its constructs.
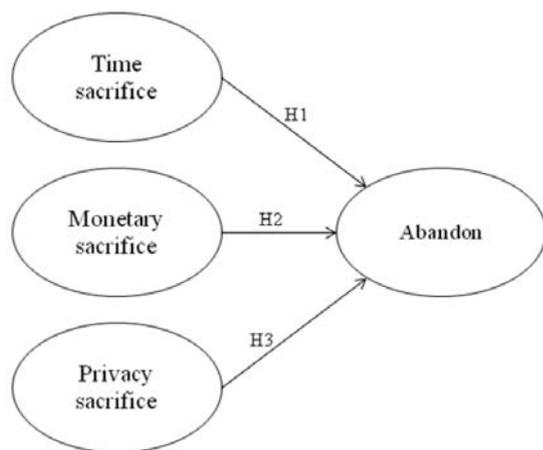

Fig. 1 Research model

III. RESEARCH METHODS

A. Data Collection - Pilot

This research targeted subjects who play mobile social games in Taiwan. A survey was conducted to test the research model and hypotheses. Participants were solicited through a web-based survey because most game players are internet users. Sample surveys were collected from current mobile social game users. A pilot test was conducted to verify the proposed measurement items. In total, 97 users responded to the survey. Table I summarizes the demographics of the respondents.

TABLE I
SUMMARIZES THE DEMOGRAPHICS OF THE RESPONDENTS (N=97)

Measure	Item	% (N=97)
Gender	Male	31%
	Female	69%
Age	Under 14	0%
	15-24	16%
	25-34	63%
	35-44	18%
	45-54	2%
	55-64	1%
Education	High school (and below)	10%
	College degree	52%
	Master's (and above)	38%
Occupation	Student	18%
	Office worker	78%
	Housekeeper	4%

B. Research Instrument

This study's questionnaire was developed from instruments used in relevant previous studies and carefully modified to ensure that the items fit the context of mobile social game use; the survey items are displayed in Appendix A. The measure of abandonment was adapted from Zeithaml et al. and Zhou et al. [32], [33]. Time sacrifice measures were obtained and modified from Cronin et al. and Teas & Agarwal [34], [35]. Measurement items for monetary sacrifice were modified from Cronin et al., Teas & Agarwal and Kim [34]-[36]. Measurement items for privacy sacrifice were modified from Cronin et al. and Malhotra et al. [34], [37]. The items were measured on a five-point Likert scale, ranging from "disagree strongly" (1) to "agree strongly" (5).

C. Analysis

A two-step approach was adopted. The first step tested the reliability and validity of the measurement model. The second step assessed the research hypotheses and structural model using partial least squares (PLS). PLS was selected for data analysis because it is suitable for small sample research and has minimal requirements for measurement scales and residual distributions [38].

IV. RESULTS

A. Tests of the Measurement Model

The reliability analysis used Cronbach's alpha and composite reliability (CR) to assess the model's internal consistency. The Cronbach's alpha value of each construct ranged from 0.78 to 0.82, exceeding the accepted level of 0.7 recommended by Hair et al. [39]. Every CR scored above 0.8, which exceeded the 0.7 score suggested by Fornell and Larcker [40]. Convergent validity was confirmed according to the three standards recommended by Bagozzi and Yi [41], i.e., all

indicator factor loadings should exceed 0.5 [39], the CR should be above 0.7, and the average variance extracted (AVE) should exceed 0.5 [40]. The indicator factor loading of every item exceeded 0.6. The CR ranged from 0.87 to 0.90. The AVE ranged from 0.70 to 0.75. Table II provides the detailed results. The discriminant validity was assessed by the square root of the AVE for each construct, which should be greater than the correlation among the constructs [40]. Table III shows that all square roots of the AVE (diagonal numbers) were greater than the off-diagonal numbers. Therefore, the measurement model in this research shows satisfactory reliability, convergent validity, and discriminant validity.

TABLE II
SUMMARY OF MEASUREMENT SCALES (N=97)

Item	Factor loadings	Cronbach's alpha	Composite reliability	Average variance extracted
Time sacrificed (TS)		0.78	0.87	0.70
TS 1	0.92			
TS 2	0.94			
TS 3	0.61			
Monetary sacrifice (MS)		0.83	0.90	0.75
MS 1	0.77			
MS 2	0.88			
MS 3	0.84			
Privacy sacrificed (PS)		0.83	0.90	0.75
PS 1	0.83			
PS 2	0.90			
PS 3	0.86			
Abandon (A)		0.82	0.89	0.74
A 1	0.89			
A 2	0.84			
A 3	0.85			

TABLE III
DISCRIMINANT VALIDITY

Construct	TS	MS	PS	A
TS	0.83			
MS	0.41	0.87		
PS	0.43	0.34	0.87	
A	0.51	0.49	0.50	0.86

B. Tests of the Structural Model

The structural model was tested with the structural equation modeling technique. The resulting estimations from PLS are shown in Fig. 2. The bootstrap resampling method was applied to determine the significance of the structural model paths. The path coefficient among the constructs and the significance of each hypothesis were examined. The testing results support the impact of time sacrifice on discontinued intention to play mobile social games (β=.261, p<0.01), thus supporting H1. The hypothesized path from monetary sacrifice is significant in the prediction of discontinued intention to play mobile social games (β=.291, p<0.05), supporting H2. The effect of privacy sacrifice on discontinued intention to play mobile social games is significant (β=.287, p<0.01), supporting H3. As hypothesized, all paths were positively significant at the p<0.05 level or above. Hence, H1-H3 were supported. The explained variance (R^2) indicates how well the antecedents explained an endogenous variable. With an explanatory power of 42%, the discontinued intention to play mobile social games is influenced by time sacrifice, monetary sacrifice, and privacy sacrifice.
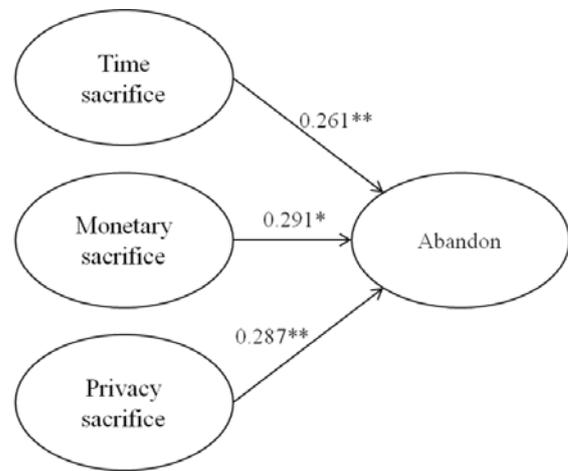

Fig. 2 Results of structure model (Significant at *p < 0.05; **p < 0.01)

V. DISCUSSION, IMPLICATIONS AND FUTURE RESEARCH

Many researchers discussed why user engage in mobile social games, suggesting that perceived enjoyment and interaction with others are important antecedents of player intention [9], [42]. However, factors related to player intention to discontinue use are rarely mentioned. This study attempts to fill that gap, exploring which types of sacrifice might influence players to discontinue playing mobile social games. The findings of the pilot study show that perceived sacrifice of time, money and privacy all influence people to abandon mobile social games. In addition, perceived monetary sacrifice had a strong impact on discontinued intention, indicating that in-game purchase fees are a key factor in continued user engagement with mobile social games. The followings are more specific discussions.

First, with regard to perceived monetary sacrifice, we found that mobile gamers are price sensitive, with most players seeing in-game purchases as being unjustifiable. However, many social games rely on such microtransactions as a key revenue source, providing a basic game for free while charging for premium items. Given the importance of this revenue source, we recommend that game providers should seek to understand factors contributing to willingness to purchase virtual goods. Second, in regard to privacy sacrifice this study found that participants may be put off from playing mobile social game because of the annoyance of frequent notifications on SNS platforms, and concern that SNSs could share their personal information and interactions with third parties in ways they might find objectionable. This finding is interesting in that these automatic notifications had originally been used to attract many social network service users to explore the game but had now become a reason to avoid the game. The social element makes a game "sticky", therefore, we recommend that administrators should provide new ways for users willingness

to help grow the game's user base but won't annoyed from it. The third finding from our pilot study revealed that perceived time sacrifice is also a factor influencing player to abandon mobile social games. When stuck on a particularly challenging level for a long while, players may come to feel they're wasting their time and look for a different game.

Both monetary and nonmonetary costs have significant impact on continued usage intention, and customers' access time, effort and privacy risk much like they do assess monetary cost, thus both monetary and nonmonetary factors are important indicators of sacrifice. Thus, game developers need to realize that there is always room for improvement because the industry is always shifting and competitive. Recently popular games can become quickly forgotten, and current preferences are quickly supplanted. Innovative game design and the inclusion of attractive features are needed to find the sweet spot which will allow game publishers to attract new active users while retaining devoted followers. After the mobile games attract the "eyeballs" of certain demographics, we suggest administrators to consider develop more complex game feature in online game context.

This research is still in progress and remains unfinished. According to the pilot test results, refinement of the constructs is required from a statistical perspective. Future work will add new variables including perceived benefits and perceived value to gain a deeper understanding into the reasons why people abandon mobile social games. Other 300 data sources will be collected for full-scale testing, and the results and implications will be analyzed and discussed in greater detail.

APPENDIX

APPENDIX A

QUESTIONNAIRE INSTRUMENT (USING CANDY CRUSH SAGA AS AN EXAMPLE)

Time sacrifice
1. I can't be bothered to spend lots of time to pass the level I am stuck on.
2. I can't be bothered to spend lots of time to get to the final level.
3. I think 30 mins is a long time to wait to play again (without cheating).

Monetary sacrifice
1. I can't justify making in-app purchases for extra moves, lives, and levels.
2. I think in-app purchase prices are too high.
3. I enjoy making in-app purchases. (reverse item)

Privacy sacrifice
1. I prefer my Facebook friends to not be able to see my game status.
2. I find frequent game notifications to be annoying.
3. I am concerned that my personal information may be disclosed to third parties.

Abandon
1. I don't play Candy Crush Saga.
2. Candy Crush Saga is not my first choice among mobile social games.
3. I play other mobile social games and don't play Candy Crush Saga anymore.

REFERENCES

[1] Strategy Analytics, 2010, "J. Jefferson, mobile gaming expected to soar as focus turns to cell phones", available at: www.brighthand.com/default. asp?newsID¼16916&news¼MobileþGamingþConsolesþDecline (accessed July 11, 2014).
[2] D. Schuurman, K.D. Moor and J.V. Looy, "Fanboys, competers, escapists and time-killers: a typology based on gamers' motivations for playing video games," Third International Conference on Digital Interactive Media in Entertainment and Arts. New York, NY. pp. 46–50, 2008.
[3] J.L. Sherry, K. Lucas and B.S. Greenberg, "Video game uses and gratifications as predictors of use and game preference," In Vorderer P, Bryant J, eds. Playing computer games: motives, responses, and consequences. NJ, Mahwah: Erlbaum, pp. 213–224, 2006.
[4] J.H. Chang and H. Zhang, "Analyzing online game players: from materialism and motivation to attitude," CyberPsychology and Behavior, 11 pp.711–714, 2008.
[5] J. Jansz, M. Tanis, "Appeal of playing online first person shooter games", CyberPsychology and Behavior, 10 pp. 133–136, 2007.
[6] N. Yee, "Motivations for play in online games", CyberPsychology and Behavior; 9, pp. 772–775, 2006.
[7] Nielsen, 2011, "The mobile media report: state of the media Q3 2011: Nielsen", available at: http://cn.nielsen.com/documents/Nielsen-Social-Media-Report_FINAL_090911pdf (accessed February 5, 2014).
[8] App Annie Index, 2014, "App Annie Index – Market Q1 2014: Revenue Soars in the United States and China," http://blog.appannie.com/app-annie-index-market-q1-2014/ (accessed August 4, 2014).
[9] P.S. Wei and H.P Lu, "Why do people play mobile social games? An examination of network externalities and of uses and gratifications", Internet Research, Vol. 24 Iss: 3, pp.313 – 331, 2014.
[10] J. Hou, "Uses and gratification of social games: blending social networking and gameplay", First Monday Peer-Reviewed Journal on the Internet, Vol. 16 No. 7, 2011.
[11] S. Angeles, 2012, "How Much Does it Cost to Make an App? An Infographic," http://www.ideatoappster.com/how-much-does-it-cost-to-make-an-app-an-infographic/ (accessed August 4, 2014).
[12] Android tablet apps, 2014, "Ways to Achieve Success in the Mobile App Marketplace," http://webcache.googleusercontent.com/search?q=cache:mxUaDImHzqkJ:www.poloburberry.com/page/5+&cd=2&hl=zh-TW&ct=clnk&gl=tw (accessed August 4, 2014).
[13] TheStreet, 2014, "King Digital Entertainment Could Be a One-Hit Wonder," http://www.thestreet.com/story/12627472/1/king-digital-entertainment-could-be-a-one-hit-wonder.html (accessed August 4, 2014).
[14] GuruFocus.com, 2014, "Why Zynga Is Better Thank King Digital Entertainment" http://www.gurufocus.com/news/265700/why-zynga-is-better-thank-king-digital-entertainment (accessed August 4, 2014).
[15] A. Eggert and W. Ulaga, "Customer perceived value: a substitute for satisfaction in business markets?", The Journal of Business and Industrial Marketing, Vol. 17 Nos 2/3, pp. 107-118, 2002.
[16] J.W. Park, R. Robertson and C.L. Wu, "Modelling the impact of airline service quality and marketing variables on passengers' future behavioural intentions", Transportation Planning and Technology, Vol. 29 No. 5, pp. 359-381, 2006.
[17] V.A. Zeithaml, "Consumer perceptions of price, quality, and value: A means–end model and synthesis of evidence," Journal of Marketing, 52, pp. 2–22, 1988.
[18] K. B. Monroe, "Pricing: Making Profitable Decisions," (2nd ed.). New York: McGraw-Hill, 1990.
[19] C. Lovelock, J. Wirtz, "Services Marketing: People, Technology, Strategy, Prentice Hall," Upper Saddle River, NJ, 2007.
[20] J. Lapierre, P. Filiatrault and J. Perrien, "Value strategy rather than quality strategy: a case of Business-to-Business professional service," Journal of Business Research, 45(1), pp. 235-246, 1999.
[21] W. B. Dodds, and K. B. Monroe, "The Effect of Brand and Price Information on Subjective Product Evaluations," Advances in Consumer Research, 12, pp. 85-90, 1985.
[22] P. Chetty, 2010, "The role of non-monetary costs," http://www.projectguru.in/publications/the-role-of-non-monetary-costs/, (accessed August 4, 2014)
[23] C.W. Chu, and H.P. Lu, "Factors influencing online music purchase intention in Taiwan", Internet Research, Vol. 17 No. 2, pp. 139-55, 2007.

[24] H.W. Kim, H.C. Chan and S. Gupta, "Value-based adoption of mobile internet: an empirical investigation", Decision Support Systems, Vol. 43 No. 1, pp. 111-26, 2007.
[25] J. Sanchez, L. Callarisa, R. Rodriguez and M. Moliner, "Perceived value of the purchase of a tourism product," Tourism Management, 27 (3) pp. 394-409, 2006.
[26] T. Geron, 2012 "As Facebook keeps growing, social gaming is changing," http://forbes.com/sites/tomiogeron/2011/09/ 23/as-facebook-keeps-growing-social-gaming-is-changing/ (accessed Aug. 4, 2014).
[27] D. Grewal, K.B. Monroe, and R. Krishnan, "The effects of price comparison advertising on buyers' perceptions of acquisition value, transaction value and behavioral intentions", Journal of Marketing, Vol. 62 No. 2, pp. 46-59, 1998.
[28] J. Lee and M. Lee, "Social Network Games Uncovered: Motivations and Their Attitudinal and Behavioral Outcomes," Cyberpsychology, Behavior, and Social Networking 15(12), pp. 1-6, 2012.
[29] S. Chen, 2010, "The social network game boom," http://www.gamasutra.com/view/feature/132400/the_social_network_game_boom.php (accessed Aug. 4, 2014).
[30] R. Lautman and K. Curran, "The Rise of Gaming on Social Networks," International Journal of Social Networking and Virtual Communities, Vol. 1, No. 1, pp. 1~6, 2012.
[31] D.H. Shin and Y.J.Shin, "Why do people play social network games?" Computers in Human Behavior 27, pp. 852–861, 2011.
[32] V. A. Zeithaml, L. L. Berry and A. Parasuraman, "The behavioral consequences of service quality," JSTOR, pp. 31-46, 1996.
[33] Z. Zhou, X.L. Jin and Y. Fang, "Moderating role of gender in the relationships between perceived benefits and satisfaction in social virtual world continuance," Elsevier, 2014.
[34] J. J. Cronin Jr, M. K. Brady and G. T. M. Hult, "Assessing the effects of quality, value, and customer satisfaction on consumer behavioral intentions in service environments," Elsevier. 76, pp. 193-218, 2000.
[35] R. K. Teas, and S. Agarwal, "The effects of extrinsic product cues on consumers' perceptions of quality, sacrifice, and value," Springer. 28: pp. 278-290, 2000.
[36] H.W. Kim, H. C. Chan and S. Gupta, "Value-based adoption of mobile internet: an empirical investigation," Decision Support Systems 43(1), pp. 111-126, 2007.
[37] N. K. Malhotra, S. S. Kim and J. Agarwal, Internet users' information privacy concerns (IUIPC): the construct, the scale, and a causal model, Informs. 15: pp. 336-355, 2004.
[38] W. Chin, B. Marcolin, and P. Newsted, "A partial least squares latent variable modeling app roach for measuring interaction effects: results from a monte carlo simulation study and voice mail emotion/adoption study", paper presented at the 15th International Conference on Information Systems, Cleveland, OH, pp. 21-41, 1996.
[39] J.F. Hair, R.E. Anderson, R.L. Tatham, and W.C. Black, "Multivariate Data Analysis," Prentice Hall, London, 1998.
[40] C. Fornell, and D.F. Larcker, "Evaluating structural equation models with unobservable variables and measurement error", Journal of Marketing Research, Vol. 18 No. 1, pp. 39-50, 1981.
[41] R.P. Bagozzi, and Y. Yi, "On the evaluation of structural equation models", Journal of Academy of Marking Science, Vol. 16 No. 1, pp. 74-94, 1988.
[42] J. Kim, Y. Chang, and M.C. Park, "Why Do People Like to Play Social Network Games with Their Friends? A Focus on Sociability and Playability," PACIS 2013 Proceedings. Paper 78, 2013.