

온라인게임 충성도에 미치는 영향요인에 관한 연구

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An Exploratory Investigation Of Player Loyalty To Online Games

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■ Abstract ■

Online games have become the focus of entertainment and multimedia industries as the developments in computer technologies are accelerated and the use of the Internet diffuses broadly. In spite of such growth of online games, academic discussions regarding online games are relatively limited. This research examines several factors that affect player loyalty to online games. In this research, the loyalty is classified into two categories, the behavioral loyalty measured by the intensity, volume, and frequency of use, and the cognitive loyalty measured by the degree of immersion in online games. In this research, an integrated model to explain and predict player loyalty to online games is proposed. Two studies are conducted to test the research model. Throughout analyzing 334 respondents, the first study finds that the impulsive personality of individual players significantly affects both behavioral loyalty and cognitive loyalty. Additionally, it finds that, whereas the behavioral loyalty is influenced by the convenience of online game playing, the cognitive loyalty is influenced by the motive of game playing and the playfulness of games. The second study finds that the behavioral loyalty differs across demographic differences of players (age and occupation), preferred online games of players, and online game playing locations, but the cognitive loyalty differs across only age differences of players. This research has opened a forum for social awareness about the online game culture, provided information to guide online game producers to prepare customer-oriented online games, and created a foundation for academic research on online game industry.

Keyword : Online Game, Customer Loyalty, Internet, Electronic Commerce

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I. Introduction

Online games have become the focus of entertainment and multimedia industries as the developments and the deployments of computer, communication and multimedia technologies are accelerated and the use of the Internet diffuses broadly. Statistics indicate that Internet users visit game-playing sites more often and stay longer than for any other Internet sites, and 19% of them regularly play games on the Internet (Draenos, 2000). That makes online game one of the most successful Internet businesses to date. Especially, the spread of mobile Internet devices, including cell phones with game-playing capabilities, may expand the online game market dramatically. To explore advantages of first movers in a largely unformed online game market, many online game producers have developed and introduced new online games by using advanced multimedia technologies, such as 3D, virtual reality or animations. The problem with making money in the fiercely competitive online game market is that these producers have not understood factors of making online users absorbed in the games and actually getting online users to play games, preferably over and over again. By building and maintaining player loyalty to online games, the producers can obtain sustainable profitability. If none of players are willing to visit a game-playing site again, its producer cannot survive. Many academic studies have identified factors that increase and retain customer loyalty in various domains (Bellman, et al., 1999 ; Lee et al., 2000). In spite of such growth of online games and interests on it, the academic discussion regarding factors inducing player loyalty to online game, is relatively limited. The

purpose of this research is to identify and examine the influencing factors for player loyalty to online games.

II. The Effects of Online Game

By now, Internet has deeply infused into most aspects of our lives. Among them, some social impacts have been the focus of interest. By using Internet, geographically distributed people can easily form a virtual community and dwell on it overcoming time and space barriers. The Internet-assisted communication transforms conventional information systems into vast human interactive networks, and offers people opportunities to experience new forms of social contacts, without any real social presence (King, 1996). The significant difference between cyberspace relationships and ones maintained by other existing technologies, such as telephone, mail, and fax, is that the online interactivity enables people to express themselves in an unrestrained manner. This experience is so stimulating, rewarding and reinforcing that some people find it hard to know when to stop (Young, 1996). Many researchers have focused on the negative aspects of the obsession. If the obsessive Internet usage interferes with regular life of people, Young (1996) calls it the Internet Addiction. The exotic characteristics of Internet communications that people hardly experience in the physical social environment are attractive enough to catch eyes of game players. Although computer games such as Solitaire and Minesweeper in the 1980s were not interactive nor played online, many researchers could observe the obsessive use of these games from some players. As the online games allow players to enjoy conversations with

other players within the virtual space, more players tend to show excessive obsession into online games and the degree of the obsessive playing is intensified. On the other hand, the nature of today's online games caters to a broader audience than the traditional interactive games in a short time.

The recent popularity of Internet may increase the risk of becoming addicted to it in much that same way that drugs or alcohol results in academic, social, and occupational impairment (Young, 1996). By using the Internet as communication media or commercial media, organizations have gained a significant improvements in efficiency. The Internet offers several benefits in various domains of today's society (Levy, 1997). The positive effects, however, have led some users to neglect family, work, and school. Young (1996) calls this phenomenon as Internet Addiction Disorder (IAD). IAD is a broad term covering a wide-variety of behavior and impulse-control problems caused by pathological, compulsive use of Internet.

Serious IAD symptoms could be observed in many online game players. People engaged in interactive video games tend to be isolated from social experiences. By integrating the Internet into games, online games restore some aspects of the social dimensions to the games. These social interactions make players absorbed in online games easily (Draenos, 2000). Compared with other online products, online games might be relatively easy to acquire and maintain customer loyalty due to the addictive nature of the Internet and games. Because online game addiction is as real as compulsive gambling, drug abuse and binge eating, many psychologists have tried to explore the phenomena and suggest treatments

for it (King, 1996 ; Young, 1996). Although the high level of commitment to online games is problematic, to survive in an extremely competitive and turbulent online game market, game producers need to understand the factors to build and retain player loyalty to online games.

III. Customer Loyalty

Securing loyal customers has become one of the most critical goals for the success of companies. Specifically, in an extremely competitive and fast-growing market, like that of online game, the success of companies is determined mostly by how effectively they build and maintain customer loyalty. With the popularity of Internet and the dramatic rise in the number of its users, many research works have been conducted in the area of customer loyalty on the Internet.

Lee et al. (2000) define customer loyalty for Internet businesses as "the customers' intention to revisit the Internet stores again based on their prior experience and expectation of the future." The definition views consistent purchases of one brand/product or consistent visits to one store as indications of customer loyalty. Assael (2001) defines this type of customer loyalty as the behavioral loyalty. Harvey (1999) states that "customers on the Internet become loyal when an Internet business finds ways to go beyond merely meeting their immediate needs to provide a truly extraordinary experience." If customers purchase a product repeatedly to meet their immediate and simple needs without any preferences, we cannot say that they have high customer loyalty to the product. If other products having similar functions are available, the customers simply switch to the new products. By offering a truly extraordinary

experience, an Internet business can make first visitors being favorable to its products and services, resulting in consistent visits and purchases. The Harvey's (1999) definition of customer loyalty emphasizes that customer loyalty should incorporate commitment rather than just repetitive behavior. Assael (2001) defines this type of customer loyalty as the cognitive loyalty. To be truly loyal, the customer must hold a favorable attitude toward a brand/product in addition to purchasing it repeatedly. The flow experience of Hoffman and Novak (1996) and the cognitive absorption of Agarwal and Karahanna (2000) provide some insights into cognitive loyalty and its antecedents.

3.1 Flow Experience

The tremendous potential of Internet as a commercial medium is widely recognized. The Internet allows companies to create a virtual marketplace where their customers can buy products and services without physically going to a marketplace, and where companies can transact business operations with their suppliers. To acquire customers' loyalty, organizations have established and deployed various strategies. In particular, by analyzing buyer behaviors, they have tried to find factors that can maximize customers' satisfaction with the Internet buying and entice customers into visiting their sites again in the future.

Hoffman and Novak (1996) state that, when customers experience the flow while navigating the Internet, they gain optimal experience, and the optimal experience results in increased participatory behaviors and positive subjective experiences from their visit. Consequently, cus-

tomers revisit the Internet site that offers a flow experience. When they gain flow experience, they keep doing similar actions without any reward. Hoffman and Novak (1996) define the flow experience as the state which is characterized by a seamless sequence of responses facilitated by machine interactivity, is intrinsically enjoyable, is accompanied by a loss of self-consciousness, and is self-reinforcing. The companies who want to acquire and maintain customers' loyalty must focus on the factors lead customers' propensity to enter the flow experience. Hoffman and Novak (1996) identify two antecedent conditions for the flow state. Firstly, the flow occurs when customers perceive that software contains challenges congruent with their own skills. Secondly, the flow occurs when focused attention is presented. Hoffman and Novak (1996) define the focused attention as a centering of attention on a limited stimulus field, and argue that it is enhanced by the content characteristics of vividness and interactivity in attracting attention.

3.2 Cognitive Absorption

Extending the notion of flow, Agarwal and Karahanna (2000) define a new construct called cognitive absorption. They define cognitive absorption as a state of deep attention and engagement with software, and identify its five dimensions : temporal dissociation, focused immersion, heightened enjoyment, control, and curiosity (Agarwal & Karahanna, 2000). Cognitive absorption occurred by the flow experience is one of the important factors to the study of technology use behavior because it serves as a key antecedent to salient beliefs about an information technology (Agarwal & Karahanna, 2000). The

<Table 1> A Comparison of Flow Experience Model and Cognitive Absorption Model

	Flow Experience	Cognitive Absorption
Cognitive Loyalty	<ul style="list-style-type: none"> - A seamless sequence of responses facilitated by machine interactivity - Intrinsically enjoyable - Loss of self-consciousness - Self-reinforcing. 	A state of deep attention and engagement with software
Dimensions of Cognitive Loyalty	Not Specified	<ul style="list-style-type: none"> - Temporal Dissociation - Focused Immersion - Heightened Enjoyment - Control - Curiosity
Antecedents	<ul style="list-style-type: none"> - Skills/Challenges - Focused Attention - Interactivity - Vividness 	<ul style="list-style-type: none"> - Cognitive Playfulness - Personal Innovativeness
Consequences	<ul style="list-style-type: none"> - Learning - Perceived Behavioral Control - Positive Subjective Experience - Distortion in Time Perception 	<ul style="list-style-type: none"> - Perceived Usefulness - Perceived Ease-of-Use

success of online game producers depends on how well their products and services provide game players with the situations and experiences that result in a state of deep attention and engagement. Agarwal & Karahanna (2000) identify two antecedents of cognitive absorption : cognitive playfulness and personal innovativeness. The individuals who perceive cognitive spontaneity during their computer interactions are likely to experience cognitive absorption. The individuals who are willing to try out new information technology to support their works are likely to experience cognitive absorption.

Although the flow experience of Hoffman and Novak (1996) and the cognitive absorption of Agarwal and Karahanna (2000) define cognitive loyalty with different ways, both theories emphasize that cognitive loyalty can be affected by interactions between personal factors (skills, control, curiosity, intrinsic interest/motivation, personal innovativeness) and environmental factors (interactivity, vividness, playfulness). Since the game-playing site is one type of

commercial Internet sites and its success heavily depends on the number of loyal customers, it should be designed to provide flow experiences and cognitive absorption for game players. If they gain flow experience and cognitive absorption while playing online games, they are easily immersed in the online games, thus resulting in revisiting the online game sites continuously without getting any reward. <Table 1> compares the flow experience and the cognitive absorption models in terms of cognitive loyalty. Based on the antecedents of cognitive loyalty from two models, the research identifies an initial list of influencing factors for player loyalty. And, based on the five dimensions of cognitive loyalty from the cognitive absorption model, the research measures the degree of cognitive loyalty.

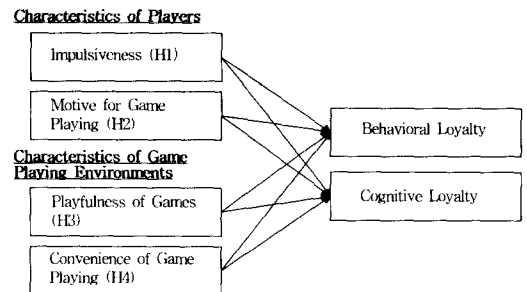
IV. Research Model for the Loyalty of Online Game Players

The purpose of the research is to examine the

factors that affect the level of player loyalty to online games. Based on analyzing two theoretical models, the research extracts initial list of factors influencing player loyalty. Then, through three rounds of panel discussion with 10 members (game producers, game players, and game programmers), the list of influencing factors is refined. The research is conducted in two phases. The first phase focuses on examining the relationship between the level of player loyalty and the four influencing factors (impulsiveness of game players, motive for game playing, playfulness of games, and convenience of game playing), and employs the regression analysis. In the second phase, by using ANOVA, the research tries to determine whether player loyalty is significantly different across some additional factors (age groups of players, occupations of players, online game types preferred, and locations of game playing).

4.1 Study I

The research model for online game player's loyalty include four independent variables and a dependent variable. As a dependent variable, player loyalty is divided into two types. The behavioral loyalty is measured by the intensity, volume, and frequency of use, and the cognitive loyalty is measured by the degree of immersion in online games. The factors influencing player loyalty to online games are categorized into characteristics of players and of game-playing environments. The research empirically investigates the impacts of these factors on player loyalty to online games. <Figure 1> depicts the research model employed to explain online game players' loyalty.



[Figure 1] Research Model

4.1.1 Impulsiveness of Game Players

Eysenck (1985) defines impulsiveness as a type of personality that makes people to take risk carelessly. Gray (1987) states that, even under the worst situations, impulsive people have hard time to stop and adjust their on-going activities. Since many games, including both online and video games, attempt to stimulate impulsiveness of players, players with higher level of impulsiveness exhibit higher level of loyalty to online games (H1).

4.1.2 Motive for Game Playing

Motive can be defined as the psychological state that triggers and maintains a specific activity. With regard to online game, players can have different motives ranged from passive motives to active motives : interesting motive, challenging motive, friend-seeking motive, escapism motive, and assaulting motive. Players who have active and specific motives for game playing are more likely to experience absorption to online games than others. Players with higher level of motive for game playing exhibit higher level of loyalty to online games (H2).

4.1.3 Playfulness of Games

Playfulness is a variable defined as "the degree of cognitive spontaneity in microcomputer

interactions” (Webster & Martocchio, 1992). There is a significant body of theoretical and empirical evidence on the importance of playfulness in technology use (Agarwal & Karahanna, 2000 ; Davis et al., 1992 ; Webster & Martocchio, 1992). If users perceive playfulness from a technology while using it, they can be easily immersed in using the technology without having any motives. Thus, players who perceive higher level of playfulness from games would exhibit higher level of loyalty on the games (H3).

4.1.4 Convenience of Game Playing

Due to the nature of online games, the loyalty of players might be influenced by the convenience of game playing. If one can play online games in a convenient environment, he/she is easily immersed in online games. To have heightened commitment on online game playing, players need to experience interactive and spontaneous

human-computer interactions supported by powerful computer and network equipments. Although players possess high psychological states that could lead high level of loyalty to online games, if they do not have a proper computer environment, they are hardly immersed in online games. Thus, players with higher level of game playing convenience will exhibit higher level of loyalty to games (H4). <Table 2> summarizes hypotheses for loyalty of online game players.

4.2 Study II

The Study I explores the relationship between characteristics of players and their playing environments. In the second phase, the research focuses on investigating the impacts of playing patterns on player loyalty. Specifically, it assesses whether or not player loyalty is different across different age groups, occupations, preferred games, and game playing locations. In the research model, the age of players, occupations of players, preferences of players, and game playing locations are independent variables, and are discrete variables. To explore the relationships between the discrete independent variables and the continuous variable (player loyalty), the research employs ANOVA for analysis.

4.2.1 Age and Occupation of Game Players

Age and occupation variables have received large amounts of attention regarding differences in the use of computers. The research examines the relationships between the loyalty to online games and age/occupations of game players. The young might be immersed in online games easier than the old primary because of differences in experiences across generations rather than any

<Table 2> Hypotheses for Study I

	Hypotheses Statements
H1a	The higher level of impulsiveness, the higher level of behavioral loyalty to online games.
H1b	The higher level of impulsiveness, the higher level of cognitive loyalty to online games.
H2a	The higher level of motive for online game playing, the higher level of behavioral loyalty to online games.
H2b	The higher level of motive for online game playing, the higher level of cognitive loyalty to online games.
H3a	The higher level of playfulness from games, the higher level of behavioral loyalty to the online games.
H3b	The higher level of playfulness from games, the higher level of cognitive loyalty to the online games.
H4a	The higher level of game playing convenience, the higher level of behavioral loyalty to online games.
H4b	The higher level of game playing convenience, the higher level of cognitive loyalty to online games.

biological aging (Marakas, et al., 1998). Because many players tend to enjoy online games by using their spare time, players who are freelancers and can manage their time by themselves, they might be absorbed in online games easily. Depending on the occupations and the age of players, their loyalty to online games is different (H5 and H6).

4.2.2 Games Preferred

Various genres of online games have been introduced in the market. Online games can be categorized into the following genres : simulation games, role-playing games, sports games, action games, shooting games, puzzle games, and adventure games. Depending on the types of preferred games, players' loyalty to online games is different (H7).

4.2.3 Locations of Game Playing

The loyalty of players might be influenced by the locations of game playing. If players play online games in a closed environment, they are easily immersed in online games. It is very hard for players to be immersed in online games in

an open environment. Depending on the locations of game playing, their loyalty to online games is different (H8). <Table 3> summarizes the eight hypotheses proposed for Study II.

4.3 Research Methodology

Based on the identified factors, a questionnaire is designed. The questionnaires are administrated via both online and off-line to the members of several online game communities. Totally, 334 questionnaires are used for the statistical analysis. The participants consist of 184 men and 150 women. <Table 4> summarizes the characteristics of participants in the study. To examine the relationships between player loyalty to online games and its influencing factors, both the regression analysis and ANOVA analysis are used. The statistical technique used for the hypotheses regarding impulsiveness (H1), motive (H2), playfulness (H3), and convenience (H4) is the regression analysis, and the statistical technique used for the hypotheses regarding age (H5), occupation (H6), preferences (H7), and locations (H8) is the ANOVA analysis.

<Table 3> Hypotheses for Study II

Hypotheses Statements	
H5a	The behavioral loyalty differs across the age groups of game players.
H5b	The cognitive loyalty differs across the age groups of game players.
H6a	The behavioral loyalty differs across the occupations of game players.
H6b	The cognitive loyalty differs across the occupations of game players.
H7a	The behavioral loyalty differs across the preferred games of game players.
H7b	The cognitive loyalty differs across the preferred game of game players.
H8a	The behavioral loyalty differs across the locations of game playing.
H8b	The cognitive loyalty differs across the locations of game playing.

<Table 4> Characteristics of Participants

Occupation	Male	Female	Total	%
High School Students	1	91	92	27.54
College Students	82	30	112	33.53
Graduate Students	2	1	3	0.90
Engineers/ Researchers	59	9	68	20.36
Sales/ Marketing	20	1	21	6.29
Office Clerks	14	18	32	9.58
Teachers/Public Service Personnels	5	0	5	1.50
No Answer	1	0	1	0.30
Total	184	150	334	100.00

V. Analysis of Results

5.1 Regression Analysis (Study I)

Regression analysis is used to examine the relationship between the behavioral loyalty and its five influencing factors (impulsiveness, motive of game playing, playfulness of game, and convenience of game playing). A reliability test for the influencing factors is performed to examine the extent to which the factors are free from random error. Cronbach's Alpha is the most widely accepted measure of internal consistency. Although there is no definite criteria of acceptable level of Cronbach's Alpha, a value greater than 0.7 is considered sufficient for the research. <Table 5> shows the Cronbach's Alpha values of the influencing factors. The reliability coefficients

of impulsiveness, motive of game playing, playfulness of game, convenience of game playing, behavioral loyalty, and cognitive loyalty are 0.7456, 0.8379, 0.7728, 0.7128, 0.6671, and 0.8384, respectively, making all the constraints useful for further analysis.

<Table 6> shows results of the regression analysis. The impulsiveness of individual players and the convenience of game playing are significantly, positively related to the behavioral loyalty. The results suggest that online game producers can increase the behavioral loyalty by designing games that stimulate players' impulsiveness or by targeting selected players who can easily access online games.

To examine the relationship between the cognitive loyalty and the five influencing factors (impulsiveness, motive of game playing, playfulness

<Table 5> Reliability Test Results

Factors	Number of Question Items	Cronbach's Alpha	No of Items Deleted from the Original Questionnaire
Impulsiveness	7	0.7456	3 items are deleted.
Motive of Game Playing	6	0.8379	7 items are deleted.
Playfulness of Game	2	0.7728	3 items are deleted.
Convenience of Game Playing	3	0.7128	--
Behavioral Loyalty	2	0.6671	--
Cognitive Loyalty	10	0.8384	2 items are deleted.

<Table 6> Regression Results for Behavioral Level Loyalty

Construct	B	Std. Error	Beta	T	R ²	Modified R ²	F
Constant	-0.001	0.051		-0.079 (0.937)	0.134	0.124	12.609 (0.000)***
Impulsiveness	0.221	0.052	0.221	4.220 (0.000)***			
Motive of Playing	0.0818	0.056	0.082	1.459 (0.145)			
Playfulness of Game	0.0580	0.055	0.058	1.055 (0.292)			
Convenience of Playing	0.250	0.052	0.250	4.780 (0.000)***			

(* : p<0.10 ; ** : p<0.05 ; *** : p<0.01)

〈Table 7〉 Regression Result for Cognitive Loyalty

Construct	B	Std. Error	Beta	T	R ²	Modified R ²	F
Constant	0.0023	0.039		0.058 (0.954)	0.509	0.503	83.930 (0.000)***
Impulsiveness	0.107	0.039	0.107	2.714 (0.007)***			
Motive of Playing	0.457	0.042	0.459	10.834 (0.000)***			
Playfulness of Game	0.376	0.041	0.377	9.094 (0.000)***			
Convenience of Playing	0.0305	0.039	0.031	0.775 (0.439)			

(* : p<0.10 ; ** : p<0.05 ; *** : p<0.01)

ness of game, and convenience of game playing), a regression model is also used. <Table 7> shows the results of the regression analysis for the cognitive loyalty. The impulsiveness of individual players, the motive of game playing, and the playfulness of game have significant, positive relationship with the cognitive loyalty. The cognitive loyalty, unlike the behavioral level loyalty, is significantly affected by individual player's motive of game playing, as well as

individual players impulsiveness. This result implies that, because the cognitive loyalty is affected by characteristics of individual players, online game producers can acquire high level of cognitive loyalty by personalizing online games based on individual player's personality types and motives. In addition, it finds that, by making online games playful, they cannot acquire the behavioral loyalty, but the cognitive loyalty. The cognitive loyalty is

〈Table 8〉 Result of ANOVA for Age

Dependent Variable	Source of Variance	D.F	Sum of Squares	Mean Square	F	Prob
Behavioral Loyalty	Between Groups	3	15.327	5.109	5.309	0.001 ***
	Within-Groups	327	314.673	0.962		
	Total	330	330.000			
Cognitive Loyalty	Between Groups	3	7.048	2.349	2.379	0.070 *
	Within-Groups	326	321.952	0.988		
	Total	329	329.000			

(* : p<0.10 ; ** : p<0.05 ; *** : p<0.01)

〈Table 9〉 Result of ANOVA for Occupations

Dependent Variable	Source of Variance	D.F	Sum of Squares	Mean Square	F	Prob
Behavioral Loyalty	Between Groups	6	29.697	4.950	5.324	0.000 ***
	Within-Groups	323	300.290	0.930		
	Total	329	329.987			
Cognitive Loyalty	Between Groups	6	4.398	0.733	0.728	0.627
	Within-Groups	322	324.042	1.006		
	Total	328	328.439			

(* : p<0.10 ; ** : p<0.05 ; *** : p<0.01)

〈Table 10〉 Result of ANOVA for Preferred Games

Dependent Variable	Source of Variance	D.F	Sum of Squares	Mean Square	F	Prob
Behavioral Loyalty	Between Groups	5	16.340	3.268	3.386	0.005***
	Within-Groups	325	313.660	0.965		
	Total	330	330.000			
Cognitive Loyalty	Between Groups	5	7.746	1.549	1.562	0.170
	Within-Groups	324	321.254	0.992		
	Total	329	329.000			

(* : $p < 0.10$; ** : $p < 0.05$; *** : $p < 0.01$)

〈Table 11〉 Result of ANOVA for Game Playing Locations

Dependent Variable	Source of Variance	D.F	Sum of Squares	Mean Square	F	Prob
Behavioral Loyalty	Between Groups	4	28.345	7.086	7.658	0.000***
	Within-Groups	326	301.655	0.925		
	Total	330	330.000			
Cognitive Loyalty	Between Groups	4	7.656	1.914	1.936	0.104
	Within-Groups	325	321.344	0.989		
	Total	329	329.000			

(* : $p < 0.10$; ** : $p < 0.05$; *** : $p < 0.01$)

influenced by the factors that are closely related to player's internal situations.

5.2 ANOVA Analysis (Study II)

ANOVA analysis is used to assess the statistical significance of differences between groups. In the second phase, the research focuses on investigating differences in player loyalty across age groups of players, occupations of players, preferred games of players, and locations of game playing. The results of ANOVA are shown in the following tables.

The research results shows that whereas the behavioral loyalty of online game players differs across all the four influencing factors (age groups, occupations, preferred games, and game playing locations), the level of cognitive loyalty is not different across all independent variables except the age groups.

VI. Discussion and Conclusion

The research explores factors that influence the loyalty of online game players. To explore the relationships between player loyalty and its influencing factors, the research uses regression analysis and ANOVA analysis. The results of the regression analysis shows that individual players with higher impulsiveness have a tendency to show higher loyalty to online games (both the behavioral loyalty and the cognitive loyalty). Additionally, whereas the motive of online game playing and the playfulness of online games affect only the cognitive loyalty, the convenience of online game playing affects only the behavioral level loyalty. The results of the ANOVA analysis shows that, whereas the behavioral loyalty of online game players differs across age, occupations, preferred games, and game playing locations, the cognitive loyalty

differs by only age. Based the results from the two studies, we can state that the internal variables of players such as the personality/age of players and the perceived playfulness of games are of critical importance in acquiring a high level of cognitive loyalty. For the behavioral loyalty, the environmental variables for game playing such as playing locations and occupations of players emerge critical factors.

This research has the potential to make contributions to both theory and practice. From a theoretical perspective, this research suggests an integrated model to explain and predict player loyalty to online games. In spite of the rapid growth of online games, academic discussions regarding online game is relatively limited. Specifically, as the importance of players loyalty becomes widely recognized for the success of online game companies, it is an impending task for the MIS scholars to understand the factors that create and maintain player loyalty to online games. By synthesizing and extending two streams of research, Flow Experience (Hoffman & Novak, 1996) and Cognitive Absorption (Agarwal & Karahanna, 2000), this research identifies the factors influencing player loyalty, and evaluates impacts of the factors on player loyalty through a survey. For practice, this research provides guidances to online game producers to acquire and maintain game players' loyalty. By providing a comprehensive model for online game player's loyalty, the research provides practitioners with better grounds for understanding online game players' loyalty and guidance to design customer-oriented online game products and services.

Appendix (Questionnaire Items)

Impulsiveness

- 1) On the spur of the moment, I tend to make promises.
- 2) On the spur of the moment, I tend to do shopping.
- 3) On the spur of the moment, I tend to say.
- 4) On the spur of the moment, I tend to act.
- 5) Sometimes I cannot control my emotion,
- 6) Due to my careless personality, I frequently destroy my plans.
- 7) Without considering results, I tend to say and act.

Motive for Game Playing

I play online games

- 1) to solve stress.
- 2) to change/refresh gloomy mind.
- 3) to forget problems.
- 4) to satisfy a demolitionary drive.
- 5) to feel victorious.
- 6) to reduce a hostile feeling.

Playfulness of Games

When playing online games,

- 1) I am creative.
- 2) I am imaginative.

Convenience of Game Playing

- 1) I find it is easy for me to access computers.
- 2) I find it is easy for me to access Internet.
- 3) I find it is easy for me to find my spare time for playing.

Behavioral Loyalty

- 1) Frequency of Playing

2) Duration of Playing

Cognitive Loyalty

- 1) After playing games, I feel relieved.
- 2) Once starting games, I find it hard to stop.
- 3) While playing games, I feel loss of my sense of time.
- 4) While playing games, I feel challenging.
- 5) While playing games, I do not feel lonely.
- 6) While playing games, I feel loss of self-consciousness.

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