

# A Study for Success Factors in On-line Games

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## ABSTRACT

The last few years have represented a boom for the online gaming industry. Internet-based online games have been an increasingly popular form of entertainment. The gaming industry estimates there will be over 26 million online gaming participants in 2002. The rapid development of online game content and related information technology will increase the size of the industry and have a profound impact on many aspects of our lives and our society. This paper develops the exploratory LISREL model for identifying the factors affecting the players' loyalty to a specific brand of online game. The concepts of flow, word of mouth, feedback, challenge, social norms, and online community activities, etc, are all introduced into the model, as the independent variables directly and indirectly affecting loyalty. Based on data collected from an online survey, the validity of the model has been tested and interesting conclusions have been developed concerning the relationships between loyalty and flow, word of mouth, and other independent variables. It is hoped that this result might provide useful guidelines for developing successful online game content.

**Keywords:** On-line game, on-line game marketing, on-line game contents, on-line game community

## 1. INTRODUCTION

The gaming industry in Korea has shown dramatic growth in online games and PC games upon expansion of the gaming markets at PC parlors and growth of the industries related to the Internet. These gaming industries show further growth through synergistic effects between other industries by interfacing with other entertainment industries including image industries such as comics and animations as well as broadcasting, the Internet, music and the advertising caricature design business.

The most significant causes of skyrocketing growth in the online gaming industries such as the Internet content business include expansion of spaces for use of the Internet such as PC parlors

upon rapid deployment of Internet infrastructure and increasing popularity of the Internet, when leased lines provide broadband access to most of the households in Korea. Statistical surveys performed abroad also indicate that Internet users remain at online gaming sites far longer than any other sites, and 19% of Internet users regularly enjoy online games[1]. In addition, growth of the on-line gaming market will accelerate further with continuing progress in information technology and development of creative gaming content. The authors of this study are studying core concepts that have recently attracted attention. To achieve this purpose, the authors of the study research flow and word of mouth, the currently highlighted concepts, for determining factors that influence behaviors of online gamers in regard to specific products, for example, factors which create high customer loyalty for the products. The authors also study the contributions to gamer loyalty of communities such as gaming communities and guilds currently attracting interest.

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## 2. THEORETICAL BACKGROUND AND HYPOTHESES OF THE STUDY

### 2.1 Customer Loyalty

Oliver[2] defined loyalty as deep devotion to certain brands for continuous purchase of preferred products or services, and pointed out that loyal customers continue to purchase the same brand in spite of situations or marketing that might influence them to switch to another brand. Customer loyalty is very convenient to businesses, which are able to maintain leadership in competition through cost savings, improved profits, effects of word of mouth and price premium effects[3]. In severely competitive markets, securing a new customer incurs five times the cost of maintaining an existing customer. Increasing customer loyalty by 5% causes profits to improve 25% to 85%[4].

Customer loyalty may seem to be the same as customer satisfaction, however, the key difference is that customer satisfaction is indicative of customer attitudes to a service, while customer loyalty determines customer behavior with regard to that service[5]. In general, customer satisfaction and customer loyalty have a close relationship: customer satisfaction is a prerequisite for customer loyalty, and is a significant factor for and enhancing customer retention[4,6].

The authors of the study employed customer loyalty as the final dependent variable from the standpoint that enhancing the loyalty of online gamers allows a business to secure an advantageous position in competition with other gaming products, and increase its revenue accordingly.

### 2.2 Prerequisites for Customer Loyalty

#### (1) word of mouth

Communication via word of mouth is defined slightly differently between authors, but a common definition is the flow of information from one individual to another. This means that communica-

tion via word of mouth is defined as the transfer of information about products and services in dialogs between people independent of the motivation of commercial gain. Details transferred mainly consist of experiences of using products, information about the products, advice, and complaints. Word of mouth effects consumer behavior, opinions, and purchasing patterns[7].

Consumers tend to express satisfaction or dissatisfaction on purchased products or services by word of mouth in a cognitive manner[8]. Experiences in services form the foundation for transferring information in words of mouth, not by cognitive assessment of expectation vs. achievement.

#### (2) Flow

The authors of the study employ the flow theory for measuring customer satisfaction levels of online games. The flow theory has been widely used for study on purchase behaviors of consumers in marketing activities. The concept of "Flow" was developed by Csikzentmihalyi[9], and has since been employed in diverse areas such as sports, shopping, games, hobbies and computers. The concept of flow has widely been recognized as a useful concept for depicting interactions between human beings and computers, and Novak and Hoffman[10] described the flow concept by providing a model of navigation in networks of Internet users in hypermedia environments. They defined a flow as an experience characterized by a consistent processes of replies promoted by mechanical operation in a computer media environment, and suggested that a flow is of significance in effective marketing including navigating behavior and positive effects. A flow can be defined as simply "Procedures of optimal experience[9]," and is similar to the psychological condition of a child absorbed in computer games.

Further interpreting the flow theory based on experiences in online games, the satisfaction of online gamers is determined by the judgment of the

gamers of the experiences, whether or not they remain in the flow state.

### (3) Relationship between Customer Loyalty, word of mouth and Flow

It is common that loyalty to services is determined by the satisfaction level of a customer for services. Pursuant to the study of Choi Dong-seong et al.[11] measuring and verifying satisfaction levels of customers by the experience of flow, the authors of the study judged that whether or not a gamer is in the flow state is determined by various experiences in gaming, and measured the satisfaction factors via flow, defining a hypothesis that the flow has meaningful effects on customer loyalty. Further, following the opinion of Oliver[8] that consumers willingly express satisfaction and dissatisfaction on purchased products or services by word of mouth, the authors of the study employ a hypothesis that the experiences of gamers in the flow have meaningful effects on word of mouth to assert that detailed expression in word of mouth such as positive recommendations and price premium to other customers, which will be advantageous in competition, have meaningful effects on customer loyalty:

H1: The flow experienced by online gamers has positive effects on customer loyalty.

H2: The flow experienced by gamers has positive effects on word of mouth.

H3: The expression by word of mouth has positive effect on loyalty in online gamers.

## 2.3 Prerequisites for Flow

### (1) Feedback

Feedback is defined as an appropriate response from online games when a user takes a certain action during gaming[12]. For example, when a user attacks and kills an enemy in a game, or achieves a certain target, the competence of the user is improved as feedback. If a user is provided with

proper feedback for a certain action during online gaming, an effective interaction with the system is made, and the user experiences flow[11]. Accordingly, the authors of the study define a hypothesis that gamers experience flow when proper feedback is provided:

H4: The feedback provided to online gamers has positive effect on flow.

### (2) Challenge

Flow can be described as having two major prerequisites, challenge and skill. Challenge is defined as an opportunity for behavior available to consumers in a computer media environment, and skill as competence of consumers in skills for use of the Internet[13]. This means that flow is an increasing composite phenomenon of challenge and skill, and it is insisted that both challenge and skill of an individual are the most significant prediction variables for flow. The authors of this study do not consider skill for gaming, since most online gamers, the subjects of this study, are skillful via continuous experience with online games.

H5: The challenge presented to gamers gives positive effect on flow.

### (3) Social Norms

Social norms are factors of social effects as well as factors having direct effect on the intention and behavior of an individual. Often an individual takes action to achieve certain targets independent of his or her own preferences, due to the effect of social norms. It is commonly thought that trends in such behaviors take place by each individual taking important people surrounding him or her as referents and complying with the expectations of those people[14]. The authors of this study define social norms as effects on individuals affecting forming values and norms of those individuals, such that behavior is significantly affected by social factors.

The authors assume that the factors of social norms effect psychological factors of gamers, and

then the experience of flow.

H6: Factors of social norms give positive effects on the flow of gamers.

2.4 Prerequisites for word of mouth

(1) Community Activities

The establishment and operation of communities are the typical ways of forming, developing, and maintaining relationships between businesses and customers over the Internet[15].

It is insisted that a business is capable of forming and enhancing relationships with customers through online communities[15]. Kim and Park[16] also proved the value of community activities for businesses by verifying that users of online communities are stronger than non-community users in purchase frequency, visit frequency and purchase switching rate. Further, the concept of communities is not restricted to geographical area any longer thanks to progress in the Internet and information technology, and it is feasible analyze behaviors of consumers as well as communities that play roles of joint consumption. Then the businesses enjoy cost-effectiveness and efficiency in sales[17].

With this social egoism, members in a community tend to favorably assess the community website to establish positive self-image, and relationship enhancement and positive expression in word of mouth for communities are achieved by the websites[18]. Therefore, word of mouth for games will be determined by level of activities within communities.

H7: Activities of gamers within communities has positive effect on expression by word of mouth.

(2) Attractiveness

Word of mouth depends on consumer's experiences of products or services. When a consumer is not satisfied by a product or service, he or she will look for an alternative, and assess the attractiveness of the alternative. If there is an alternative

better than the current product or service, the consumers' motive for continuing the current relationship is reduced[19].

When considering the hypotheses described above, gamers' word of mouth will praise current games which are high in attractiveness. If the gamers consider the current games not attractive, they look for alternatives (other game), and select the most attractive alternative, and will then express negative word of mouth regarding the current game. This yields a hypothesis as follows:

H8: The attractiveness of games gives positive effects on word of mouth.

The theoretical study model suggested in this study is illustrated in Fig. 1:

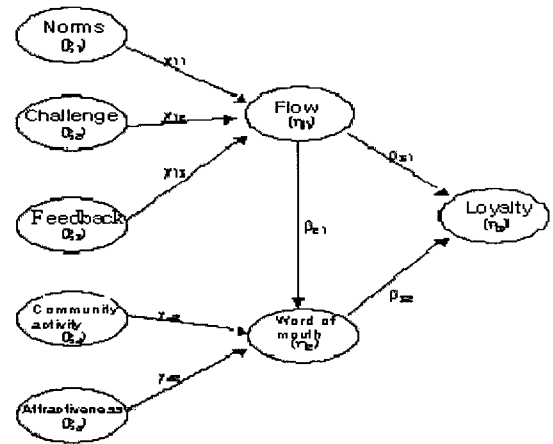


Fig. 1 Study Model.

3. POSITIVE ANALYSIS AND RESULTS

3.1 General Characteristics of Data

Collection and Models

The authors of the study used the online questionnaire method over the Internet. The authors employed the surveys in the form of banner advertisement on popular portal sites. The authors used 430 replies from a total of 495, ignoring frivolous replies, for actual analysis.

The primary age brackets for online games are: twenties (72.3%), and teens (18.4%). 79.1% of the total respondents indicated "student" as primary occupation, and this indicates gaming is mainly effected by environment and cultural factors rather than spending spare hours. Residence is the primary location of gaming due to popularization of broadband Internet access, and 69.3% of the total respondents indicate they spend one to two hours per day gaming. 89.9% of the total respondents regard themselves as of average income level or above, and the average reported expense for gaming was 75,728 won per month.

Table 1. General Characteristics of Study Model

Item		Frequency (person)	Rate(%)
Age	Young than 19	79	18.4
	20 - 29	311	72.3
	30 - 39	38	8.8
	Older than 40	2	0.5
Gaming Location	Residence	308	71.6
	PC parlor	102	23.7
	School/Office	15	3.5
	Others	5	1.2
	Less than 10	15	3.5
Expenditure for gaming (unit: thou- sand Won)	More than 10, less than 25	34	7.9
	More than 25, less than 50	120	27.9
	More than 50, less than 75	135	31.4
	More than 75, less than 100	55	12.8
	More than 100	71	16.6
Average gaming duration a day (hour)	Longer than 5	8	1.9
	Longer than 3	48	11.2
	2	126	29.3
	1	172	40.0
	30 min.	76	17.6

\* The expenditure includes expenses of online games, PC packaged games, PC parlor admission and Internet line charges.

### 3.2 Analysis of Exploratory Factors and Reliability

The authors of the study executed the primary analysis of exploratory factors, and the secondary analysis of confirmatory factors to secure validity and reliability for better structural concept.

First, the authors of the study executed the exploratory factor analysis pursuant to the principal component method based on the varimax rotation mode for each study unit. The authors defined the assessment criteria: Greater than 0.4 of both factor loading value and communality estimation.

The factor analysis results for the content factors of games satisfy both of the factors, loading value and the communality estimation over 0.4, and the analyzed factors are as shown in Table 2. The measurement items for flow, feedback, challenge and community activities are loaded as intended by the authors, every factor shows a value greater than 0.6 in the results of calculation of Cronbach  $\alpha$  in measurement of reliability (internal consistency) for the factors loaded on each factor. The common admissible value of Cronbach  $\alpha$  is 0.7, and it is suggested that the value of 0.6 is also admissible for exploratory studies.

The factor analysis results for the brand factors of games satisfy both of the factors, having loading value and communality estimation over 0.4, and the analyzed factors are as shown in Table 2. The measurement items for attractiveness, social norms, word of mouth and customer loyalty are loaded as intended by the authors, and every factor shows a value greater than 0.6 in the results of calculation of Cronbach  $\alpha$  in measurement of reliability for the factors loaded on each factor.

### 3.3 Analysis of Confirmatory Factors, and Reliability and Validity

The most admissible validities include convergent validity, discriminant validity, and nomological validity, and the authors of the study verify

Table 2. Analysis of Exploratory Factors and Reliability for Contents Factors of Games

Factor	Questionnaire item	Factor loaded value	Reliability
Flow	Flow1	The procedures of the game were interesting.	0.6274
	Flow2	This game is very hilarious and pleasant.	
	Flow3	I was fully absorbed in the game.	
Feedback	Reward1	The feedback (adjustment of competence/record of achievement/addition of new items) allowed to me after the game (or level-up) is appropriate	0.7695
	Reward2	The feedback allowed to me after the game (or level-up) gave positive effects on the next game.	
	Reward3	Diversified feedbacks have been given during the game.	
Challenge	Challen1	The game definitely sets targets of mine.	0.6622
	Challen2	The target of mine provides a value for challenge in the game.	
	Challen3	The game provides sufficient information for achieving the target in the game.	
Community activities	Mutual1	Other gamers recognize me and the value of mine when the competence of mine increases.	0.6799
	Mutual2	The game provides appropriate way for information exchange with others.	
	Mutual3	The game allows users to configure effective affiliate groups.	

the convergent validity only. When the factor loading value provided from LISREL is statistically significant, LISREL has convergent validity.

Next, the confirmatory factor analysis results for the brand factor of games are as shown in Table 3. The analysis results show good measurement of all the conceptual reliabilities exceeding 0.5, however, the mean-variance sampling fails to satisfy criteria 5 in the loyalty factor by not quite reaching 0.5. Lastly, the convergent validity is determined to satisfy the criteria, since the estimation of full standardization of both the contents factors

and the brands factors of games renders statistically significant values.

### 3.3 Verification of Study Models and Hypothesis

#### (1) Verification of Study Models

The verification results of the whole structural models suggested in this study indicate the structural model (Fig. 2) has validity of  $\chi^2=528.38$ ,  $d.f=234$ ,  $p=0.00$ ,  $GFI=0.91$ ,  $AGFI=0.88$ ,  $RMR=0.053$ ,  $NFI=0.86$ ,  $CFI=0.91$ , and  $RMSEA=0.054$ .

Table 3. Analysis of Exploratory Factors and Reliability for Brand Factors of Games

Factor	Questionnaire item	Factor loaded value	Reliability
Attractiveness	Attract1	This game is highly attractive.	0.651
	Attract2	This game is favorable.	0.659
	Attract3	This game is unique.	0.757
Norms	Norm1	It seems that many of gamers recognize this game via events such as gaming competition.	0.838
	Norm2	The game has widely been recognized via media.	0.875
	Norm3	The game is acknowledged the leader of the games.	0.760
Word of mouth	Infomou1	I strongly recommend this game to others.	0.671
	Infomou2	I directly tell experiences of mine in this game to others.	0.829
	Infomou3	I tell characters and items in the game to others.	0.812
Loyalty	Loyalty1	I will continue enjoying this game.	0.616
	Loyalty2	I will continue using this game even though other games provide additional favors.	0.815
	Loyalty3	I prefer this game to other games.	0.749
Flow	Flow1	The procedures of the game were interesting.	0.686
	Flow2	This game is very hilarious and pleasant.	0.732
	Flow3	I was fully absorbed in the game.	0.652
Feedback	Reward1	The feedback (adjustment of competence/record of achievement/addition of new items) allowed to me after the game (or level-up) is appropriate.	0.819
	Reward2	The feedback allowed to me after the game (or level-up) gave positive effects on the next game.	0.839
	Reward3	Diversified feedbacks have been given during the game.	0.781
Challenge	Challen1	The game definitely sets targets of mine.	0.735
	Challen2	The target of mine provides a value for challenge in the game.	0.802
	Challen3	The game provides sufficient information for achieving the target in the game.	0.727
Community activities	Mutual1	Other gamers recognize me and the value of mine when the competence of mine increases.	0.518
	Mutual2	The game provides appropriate way for information exchange with others.	0.838
	Mutual3	The game allows users to configure effective affiliate groups.	0.847

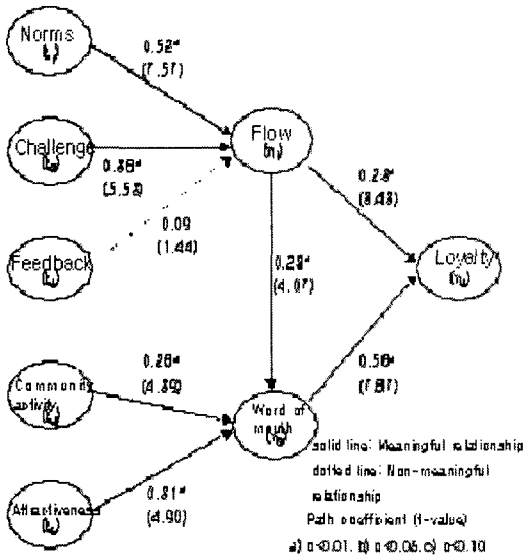


Fig. 2. Analysis Results of Structural Model.

(2) Verification of Study Hypothesis

The causal relationship between the factors in the study models is analyzed as shown in Table 4: Social norms, challenge, feedback, community activities, attractiveness, flow, word of mouth and loyalty.

First, the verification results of hypothesis 6 (H6) of any meaningful effects of norm ( $\xi_1$ ) to flow ( $\eta_1$ ) indicate positive meaningful effects exceeding meaningfulness level of 0.05 with the path coefficient of 0.52 and t-value of 7.57 to support H6. The verification results of hypothesis 5 (H5) of any meaningful effects of challenge ( $\xi_2$ ) to flow ( $\eta_1$ ) indicate positive meaningful effects exceeding meaningfulness level of 0.05 with the path coefficient of 0.36 and t-value of 5.53 to support

Table 4. Results of Analysis of Causal Relationship between Factors

Hypothesis	Path	Direct effects		Indirect effects	
		Path coefficient	t-value	Path coefficient	t-value
H1	Norm ( $\xi_1$ ) → Flow ( $\eta_1$ )	0.52	7.57 <sup>a</sup>		
H2	Challenge ( $\xi_2$ ) → Flow ( $\eta_1$ )	0.36	5.53 <sup>a</sup>		
H3	Feedback ( $\xi_3$ ) → Flow ( $\eta_1$ )	0.09	1.44		
H4	Community activity ( $\xi_4$ ) → Word of mouth ( $\eta_2$ )	0.26	4.39 <sup>a</sup>		
H5	Attractiveness ( $\xi_5$ ) → Word of mouth ( $\eta_2$ )	0.31	4.90 <sup>a</sup>		
H6	Flow ( $\eta_1$ ) → Word of mouth ( $\eta_2$ )	0.28	4.07 <sup>a</sup>		
H7	Word of mouth ( $\eta_2$ ) → Loyalty ( $\eta_3$ )	0.56	7.67 <sup>a</sup>		
H8	Flow ( $\eta_1$ ) → Loyalty ( $\eta_3$ )	0.23	3.43 <sup>a</sup>	0.16	3.81 <sup>a</sup>
	Norm ( $\xi_1$ ) → Word of mouth ( $\eta_2$ )			0.15	3.79 <sup>a</sup>
	Challenge ( $\xi_2$ ) → Word of mouth ( $\eta_2$ )			0.10	3.44 <sup>a</sup>
	Feedback ( $\xi_3$ ) → Word of mouth ( $\eta_2$ )			0.02	1.37
	Norm ( $\xi_1$ ) → Loyalty ( $\eta_3$ )			0.20	4.92 <sup>a</sup>
	Challenge ( $\xi_2$ ) → Loyalty ( $\eta_3$ )			0.14	4.20 <sup>a</sup>
	Feedback ( $\xi_3$ ) → Loyalty ( $\eta_3$ )			0.03	1.41
	Community activity ( $\xi_4$ ) → Loyalty ( $\eta_3$ )			0.15	4.04 <sup>a</sup>
	Attractiveness ( $\xi_5$ ) → Loyalty ( $\eta_3$ )			0.18	4.38 <sup>a</sup>
	R <sup>2</sup> (Flow)	0.44			
	R <sup>2</sup> (Word of mouth)	0.40			
	R <sup>2</sup> (Loyalty)	0.49			
	Model validity	$\chi^2=528.38$ , d.f=234, p=0.00, GFI=0.91, AGFI=0.88, RMR=0.053, NFI=0.86, CFI=0.91, RMSEA=0.054			



H5. Meanwhile, the verification results of hypothesis 4 (H4) of any meaningful effects of feedback ( $\xi_3$ ) to flow ( $\eta_1$ ) indicate the path coefficient of 0.09 and t-value of 1.44, and H4 is not supported at meaningfulness level of 0.05.

Next, the verification results of hypothesis 7 (H7) of any meaningful effects of community activity ( $\xi_4$ ) to word of mouth ( $\eta_2$ ) indicate positive meaningful effects exceeding meaningfulness level of 0.05 with the path coefficient of 0.26 and t-value of 4.39 to support H7. The verification results of hypothesis 8 (H8) of any meaningful effects of attractiveness ( $\xi_5$ ) to word of mouth ( $\eta_2$ ) indicate positive meaningful effects exceeding meaningfulness level of 0.05 with the path coefficient of 0.31 and t-value of 4.90 to support H8.

Lastly, the verification results of hypothesis 2 (H2) of any meaningful effects of flow ( $\eta_1$ ) to word of mouth ( $\eta_2$ ) indicate positive meaningful effects exceeding meaningfulness level of 0.05 with the path coefficient of 0.28 and t-value of 4.07 to support H2. The verification results of hypothesis 3 (H3) of any meaningful effects of word of mouth ( $\eta_2$ ) to loyalty ( $\eta_3$ ) indicate positive meaningful effects exceeding meaningfulness level of 0.05 with the path coefficient of 0.56 and t-value of 7.67 to support H3. The verification results of hypothesis 1 (H1) of any meaningful effects of words of flow ( $\eta_1$ ) to loyalty ( $\eta_3$ ) indicate positive meaningful effects exceeding meaningfulness level of 0.05 with the path coefficient of 0.23 and t-value of 3.43 to support H1.

### (3) Analysis of Indirect Relationship

The authors of the study have examined the direct effects of a certain causal variable on a certain resultant variable so far. Now, the authors of the study examine the indirect effects of a causal variable to a resultant variable via other variables.

First, flow ( $\eta_1$ ) gives direct effects to loyalty ( $\eta_3$ ) as well as indirect effects through word of mouth ( $\eta_2$ ). In other words, flow ( $\eta_1$ ) gives indirect pos-

itive meaningful effects to loyalty ( $\eta_3$ ) with the path coefficient of 0.16 and t-value of 3.81 via the word of mouth factor as shown in Table 4.

Besides, norm ( $\xi_1$ ) and challenge give indirect positive effects to word of mouth ( $\eta_2$ ), and norm ( $\xi_1$ ), challenge ( $\xi_2$ ), community activity ( $\xi_4$ ) and attractiveness ( $\xi_5$ ) to loyalty ( $\eta_3$ ).

In addition, the squared multiple correlations ( $R^2$ ) of flow, word of mouth and loyalty, some of endogenous latent variables, are 0.44, 0.40 and 0.49 respectively. For example, 49% of loyalty is described in flow and word of mouth.

### 3.4 Interpretation of Results of Positive Analysis

The authors of the study verified the hypothesis for factors of flow and word of mouth defined as variables having direct effect on the final dependent variable in the study model, and found out that the flow gives meaningful effects (H3) to customer loyalty.

Next, the authors of the study verified the hypotheses for social norms, challenge and feedback defined as variables having effects on flow. The challenge gives direct meaningful effects to flow (H5), and indirect meaningful effects to customer loyalty at the same time. This means that encouraging challenge is an important factor for improving flow experience and customer loyalty of gamers in online games. Then, the authors of the study verified that flow is meaningfully affected by social norms that have been deemed to alter the behavior of individuals in the precedent studies by affecting values and norms of individuals (H6), however, the authors did not verify that feedback factor has meaningful effect on flow (H4).

Most game companies devote their resources in the development of role-playing games, which currently attract huge interest from gamers, and some role-playing games have depicted illegal transaction of items, and raised community concerns. The authors of the study anticipated that

a factor called feedback plays a significant role in determining the enjoyment for gamers derive from online games considering the situations stated above, but failed to derive any absolute basis for that anticipation.

Lastly, the authors of the study defined community activity, attractiveness and flow as variables which affects to word of mouth, and verified the effects. The authors of the study verified that community activity affects on word of mouth (H7). The degree of freedom is considered the reason of higher participation in the gaming community of gamers preferring such games. Since a gamer shall determine his or her own paths, and any counter-measures for changes in environments on the paths with his or her own discretion, the gamer demands sufficient information on games, and there often arise situations that are hard for the individual gamer to solve[20].

The authors of the study verified that the attractiveness factor has meaningful effects on word of mouth (H8). If a gamer considers the current game highly attractive, he or she expresses positive word of mouth about the game. On the other hand, if a game is unattractive, he or she looks for alternative games, and selects the an attractive alternative. In addition, large portal sites currently launch games in the gaming industries, and most of the games are RPGs. The authors of the study also verified that flow has meaningful effects on word of mouth (H8), and this verification agrees with the theory of Oliver[21] that customers express satisfaction or dissatisfaction of products or services by word of mouth.

#### 4. CONCLUSION AND DISCUSSION

The authors of the study surveyed actual gamers of online games to perform LISREL analysis of significant factors of online games having effects on customer loyalty to online games. The

analysis model in the study was built to focus on factors including customer loyalty, flow, word of mouth and online communities that have largely been studied in the areas of administration.

The results of analysis indicate meaningful effects of flow and word of mouth to customer loyalty, a dependent variable. This means that it is essential to allow customers to experience flow and promote community activities for active expression in word of mouth for the success of online games. In particular, it is imperative to provide gamers with challenge to let gamers experience flow: Games consistently providing challenge are preferred while those failing to satisfying the desires of gamers tired of restricted maps or characters are gradually dismissed leading to a dramatic reduction of gamers over time.

In addition, it is widely recognized that online communities such as clans and guilds spontaneously built around online games have played a significant role in enhancing the popularity of the games through active expression in word of mouth. The analysis results of the study also indicate that community activities have meaningful effects on word of mouth. Community activities promote cooperation with other gamers for more information on proceeding with gameplay[20], and the trends of upgrade of online games are a natural results to arm characters by applying new functions and systems, and opening separate Internet chat to help form communities.

Though attractiveness for games has meaningful effects on word of mouth, any alternative games released for gamers searching for new challenges cause gamers to feel attracted to the alternative games, and customer loyalty for the existing games is reduced by a decrease in positive word of mouth. Therefore, it is imperative to continuously provide the gamers with challenges through consistent upgrades of the games.

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