

A Conceptual Model of Online Game Continuanace Playing

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Abstract. Today's online gaming customers are very demanding, hence there is a need for the game vendors and developers to understand and keep pace with customers' demands. The purpose of this paper is to survey the current literatures and summarize the reasons why users tend to play a certain online games longer. In this paper, we propose a research model to predict online games continuance play. We believe this framework will help both researchers and practitioners in game research, design and development.

Keywords: Online games · IS continuance · Intention

1 Introduction

In the past two decades, online games have gained popularity around the world. An online game adopted client server technology to let game players play the same game from different locations all over the world. Users can use computers, mobile devices or video game consoles to play the online games. There are variety online games available in the market. According to the new Online Game Market Forecasts report by Statista Incorporation [1], online game market will reach \$41.4 billion at the end of 2015. In another report by Holodny [2], online gaming in the US is expected to be a 5.2 billion business by 2020. Online games are computer controlled games, including both PC games and video games, played by consumers over network technology, especially through the Internet. Online games can be categorized into multiplayer and single-player games. At present, multiplayer games, especially massively multiplayer online games (MMOG) are most successful among all online games. World of Warcraft, one of the famous MMOG, surpasses 100 million subscribers in 2014 [3].

The rapid growth of online games has caught the attention of the gaming industry. Investigation of consumers' online behavior becomes critical. According to Lo and Chen [4], the profitable life cycle of an online game goes down to 8 months to a year from 18 months to 3 years in average in the past. This means majority online game players switch their games every 8–18 months. Game developers try to make more profit from each game. However, they are facing two serious issues: market competitiveness and high demanding quality from customers. Every year, there are more than a hundred new online games available in the market from different game developers.

Typical customers only focus on one or two online games at a certain time and customers are demanding on all aspects of the online games, including game stories, game graphics, game services, and so on [5]. Therefore, it is increasingly important to study the key factors for retaining customers in the game. As suggested by Semeijin et al. [6], maintaining customer loyalty not only lowers the cost of acquiring new customer, but also brings in substantial revenues. A typical revenue model of an online game is to charge subscribing fee every month. However, to attract more players, who are not willing to pay fees, most of the current online game developers start to offer the online games for free to the consumers. In the free games, their revenue model changed from collecting subscribing fee to allure customers buying virtual goods in the games. Therefore, the longer time players play the online games, the more money they possibly will spend on the game, and this will bring more revenue to the game vendors or developers. Few empirical research has been conducted on how to extend current customers' playing time and what are the variables impacting the online game continuance play. The purpose of this study is to review the current literature and establish a research model to explain what factors affect online game adoption and how to extend online game playing time.

2 Theoretical Background

There are many studies focus on how to persuade users to use IS or IT devices, such as research on IS acceptance models [7]. Recently, more and more researchers start to switch to post-adoption studies, such as how to attract consumers to continually use IS or IT devices, because IS/IT vendors and developer realize that retain their customers to keep using the IS or IT devices is getting more and more important to help them expand their revenue.

2.1 Post-Acceptance Model of IS Continuance

The initial IS continuance research model, explaining customer behaviors of their intentions to continually use IS or IT devices, was developed by Bhattacharjee based on expectation-confirmation theory (ECT) [8]. Bhattacharjee [8] argues that

- Users' extent of Confirmation, which represents the level of a customer's evaluative response regarding his/her expectations of the IS [9], is positively associated with their satisfaction of using the IS and is positively related to perceived usefulness;
- Users' perceived usefulness of IS, which is one of the key variables in technology acceptance model (TAM) [7], is positively associated with their satisfaction with IS use and associated with there is continuance intention;
- Users' level of satisfaction with initial IS use is positively associated with there is continuance intention.

The author summarizes that IS continuance more depend on users' first-hand experience with the IS. IS vendors and developer should adopt two different strategies to maximize their return on investments in customers' training: emphasize potential benefits to the new customers while educating continued users on how to use the IS efficiently [8].

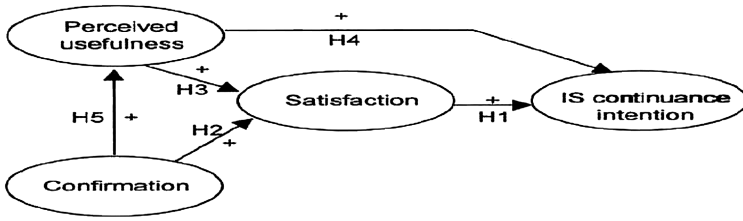


Fig. 1. A post-acceptance model of IS continuance

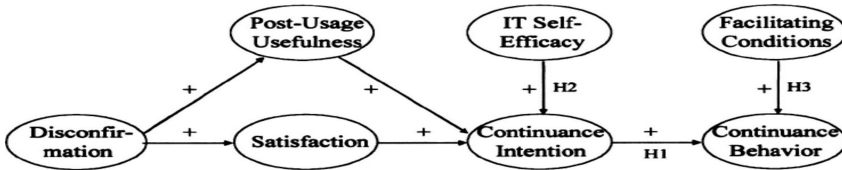


Fig. 2. An extended model of IT continuance

2.2 An Extended Model of IT Continuance

Based on the Post-Acceptance Model, Bhattacharjee, et al. [10] extend the model by adding three more variables: IT self-efficacy, facilitating conditions, and continuance behavior. Self-efficacy refers to one’s conviction or belief in his/her ability to independently complete a certain task successfully [11]. According to previous research [12, 13], IT self-efficacy is a positive indicator to predict users’ utilizations of computers and IS. Bhattacharjee, et al. [10] demonstrate that IT self-efficacy tends to cause users’ belief in their ability to successfully utilize the IS right after their initial usage. However, they argue that and self-efficacy will not impact users’ decisions/behaviors to continually use IT/IS. Facilitating conditions refer to the availability level of external resources required by IT usage, such as the speed of the Internet when users are playing online games. In the extended model of IT continuance, Bhattacharjee, et al. [10] conclude the following additional relationships:

- Users’ IT self-efficacy is positively associated with their IT continuance intention;
- Users’ perception of facilitating conditions is positively associated with their IT continuance behavior;
- Users’ IT continuance intention is positively associated with their IT continuance behavior Fig. 2.

2.3 IS Use Continuance Intention Prediction Using Perceived Needs Fulfilment

Based on theory of human needs [14] and existence, relatedness and growth needs (ERG) theory [15], Yeh and Teng [16] develop a research model to predict users’ IS continuance usage from perceived needs fulfillment. They claim that existence need from ERG theory, which refers to users’ needs to perform the assigned job duty

successfully, can be transferred to extended usefulness with perceived efficiency and perceived effectiveness. Additionally, the authors believe that relatedness need, which refers the individual intentions to communicate with other human beings, can be reflected to perceived relatedness to increase the users’ interactions with others while using the IS. Similarly, growth need, which relates to “the urge of an individual to fully develop his/her potential”, is transferred as perceived self-development fulfilment to obtain the opportunities to encourage users’ learning, growth and self-development. In this research model, Yeh and Teng [16] suggest three new relations:

- Users’ perceived needs fulfilment of IS use is positively related to their IS use continuance intention;
- Users’ perceived needs fulfilment of IS use is positively related to their satisfaction with IS use;
- Users’ extent of confirmation is positively related to their perceived needs fulfilment of IS use Fig. 3.

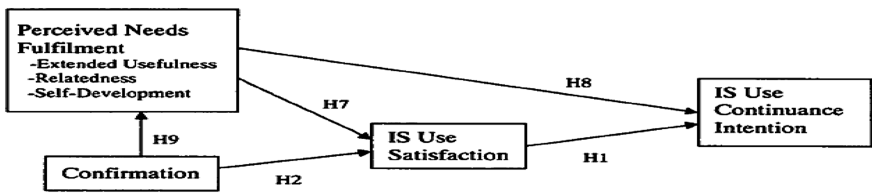


Fig. 3. Research model: predicting continuance intention using perceived needs fulfilment

2.4 Applications of Information Systems Continuance Models

2.4.1 Research Model Adopted to Mobile Applications

Hong et al. [17] compared three research models, TAM, expectation-Confirmation Model (ECM) by Bhattacherjee [8], and the proposed Extended ECM by the authors, in mobile Internet. Since this is an early study, authors are kind of misunderstand the three models. They include TAM as one of the continuance research model. According to Bhattacherjee [8], TAM is just an IS acceptance model which focus on the initial usage of IS while as the other two models in Hong et al.’s study are related to continuance usage of IS. One variable that this study added is perceived ease of use, which is adopted from TAM. In the context of mobile Internet, it is a reasonable factor that impacts the satisfaction and IS continuance Fig. 4.

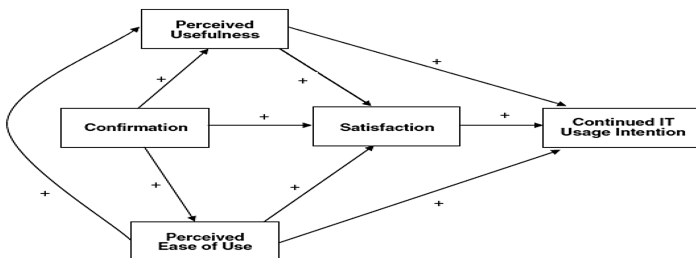


Fig. 4. Extended ECM

Chen et al. [18] expand the ECM with four more variables: Information Quality, System Quality, Process Quality, and Hedonic Value. Information quality, which refers to the quality of information output by the IS, and system quality, which focuses on the quality of functions/features in the IS, are generated from DeLone & McLean research [19], whereas hedonic value, which refers to users' enjoyment of using IS, is adopted from Karaiskos et al. study [20] Fig. 5.

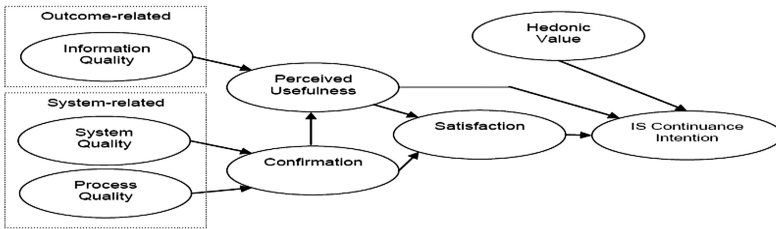


Fig. 5. Extended model of IS continuance for mobile applications

2.4.2 Research Model Adopted to Social Network

With the development of web 2.0, social network becomes to a popular study area. Extended from ECM, subjective norm and enjoyment were added to the research model in context of social network [21]. Different from most of the IS, social network focus on communications among users, therefore, subjective norm, which refers to a person's behavioral intentions influenced by people who are important to him/her, is positively related to social network use. Enjoyment is another special factor associated with social network because one of the purposes people use social network is to have fun. Therefore, authors demonstrate that enjoyment is positively related to satisfaction, continuance intention, and continuance usage of social network Fig. 6.

By comparing users in US and Taiwan, Ku et al. [22] propose another research model for social network continuance usage. Besides privacy concerns, region, and gender, which are three special factors in this study, perceived critical mass is a new variable in this model. Critical mass refers to the intention to use the social network when sufficient number of users are using the same system. Gratifications in this research model is the same factor as the previous one named enjoyment Fig. 7.

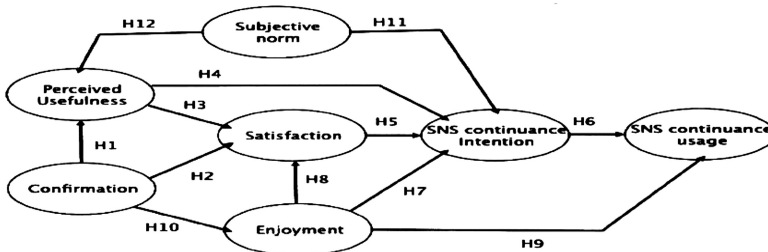


Fig. 6. Research model 1 for social network services

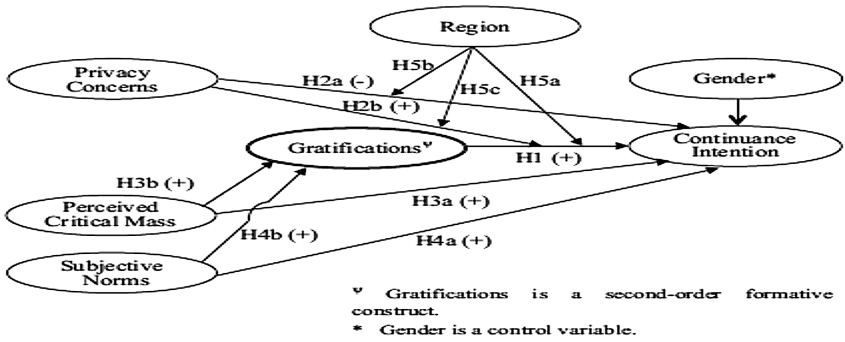


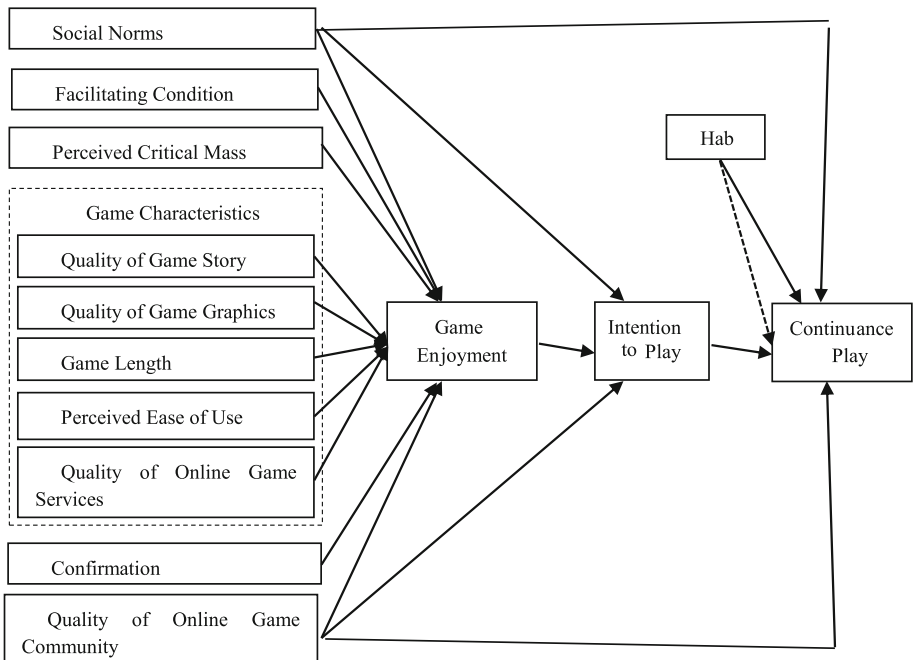
Fig. 7. Research model 2 for social network services

2.4.3 Research Model Adopted to Online Learning Technology

In the proposed research model, Limayem and Cheung [23] argue that habit of using a technology could cause the continuance use because habit strengthens the continuance activities or decisions without thinking about it or performing further decision making process [24, 25]. Habit is added as a moderator variable impacting on the relationship between continuance intention and continuance usage.

3 Proposed Research Model

Based on the previous research models and previous online game studies, we propose a conceptual online game continuance model as depicted in Fig. 1. This model integrates the motivational perspective into the original TAM and ECM. Discussions of this model are presented in the following sections.



3.1 Variables from Previous Model

In the propose research model, social norms, same as subjective norms, facilitating condition, perceived critical mass, perceived ease of use, confirmation, enjoyment, intention, and continuance play are the variable explained in previous studies in the literature review section. Because of the specialty of online gaming, there are several more special variables adopted in this model.

3.2 Game Characteristics

Product quality is one of the crucial factors influencing customers' consumption [26]. For online products, since most purchasing and service activities are completed over the Internet, both product quality and service quality are important determinants of customers' behavioral intentions [27]. As online products, online games' quality is important. It includes but not limited to game story, game graphics, game length, and game operations.

3.2.1 Game Story

Most online games create virtual environments in the game. Game stories are often used to immerse game players in the virtual world. A good story attracts players' attention and increases players' curiosity to explore the virtual world. The story makes the game more enjoyable and fulfilling. These attractive tasks, like projects in real life, keep players continuously returning to the game whenever they have time to play [28]. A good story offers a wonderful growing space for the actors created in the game. From the beginning of the story, game players "watch" and "feel" the growth of their actors along the story phases. The good story environment let the players create the history using their actors in the virtual world. The players will cherish the stories they created in the game and this will bring them enormous enjoyment in the game and let them forget all the unpleasant things in their real lives [5].

3.2.2 Game Graphics

3D graphics has been receiving great attention recently due to its use in various applications such as movie making, 3D games, virtual reality modeling and 3D Graphical User Interface (GUI) development. Graphic attractiveness is a key element in creating an enjoyable user experience in online games [5]. Graphic designs for online games consist of static graphics, movement graphics and special graphics. Static graphics refer to the non-movement items in the game environment. A better design of static graphics makes players feel more real in the virtual world. Movement graphics includes all the movement design in the game, such as running, fighting, etc.

3.2.3 Game Length

The game length refers to the average time game players complete the online games by reaching the highest level of the actors, winning the final game items, or completing all the core game tasks. There is no best number to target regarding online game length because each online game is unique with special story and special game settings.

However, there could be an ideal length uniquely for each game [29]. For a certain game, players will not have enough time to enjoy the story and all the graphic designs in the game if the game is too short. On the other hand, if the length of the online game is extended too long, players may be exhausted and eventually quit if they can hardly see the end of the road. An appropriate game length will lead to an enjoyable experience.

3.2.4 Quality of Online Game Services

Service quality is one of the key factors in e-commerce success [30]. The quality of online game services are evaluated directly by game players according to the response promptness, problem solving ability, problem solving time, information richness of the game, attention to particular player needs, promise-keeping, game master (instant helper in the game) service behavior, and so on. Online players will perceive the services and make their judgments to determine the service quality. Their judgments significantly impact on their enjoyment of the game playing [31].

3.3 Online Game Community

An online community is defined as social groups of people who communicate with each other via network technology, such as Internet. Typically, each online community has a community theme, such as purposes or reasons why people are here, to attract more members. The theme of online game community is focus on the game to share information about game news, game experiences for different tasks and different types of actors, stories related to the certain game, social network communications, and so on. Through the online game community, players share their game information, seek helps from the community for game activities, and even build their social network beyond the game. The better quality of online game community motivates more players to gather and share information in the community, and in return stimulates even higher quality of the community. Players will feel comfortable and enjoyable if they have a social network in the game, which they build through the online game community. This community network also encourages their intentions to play the game and eventually increase their loyalty to the game [32].

4 Conclusions

The purpose of this study is to develop a theoretical research model regarding the key factors affecting customers' online game continuance usage based on a literature review. There are studies developed IS continuance research model and models for applications in mobile technology usage, social network adoption, and e-learning technology. However, there is no study focusing on the online game continuance playing area. This paper summarizes the previous IS continuance studies and proposes a complete research model to explain our research question: why there are online games that last over than 10 years while most of the online games only had short life less than 2 years.

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