

4-2012

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Jing Da Zhan

*Department of Information Systems, National University of Singapore, zjingda@comp.nus.edu.sg*

Hock Chuan Chan

*Department of Information Systems, National University of Singapore*

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### Recommended Citation

Zhan, Jing Da and Chan, Hock Chuan (2012) "Government Regulation of Online Game Addiction," *Communications of the Association for Information Systems*: Vol. 30 , Article 13.

DOI: 10.17705/1CAIS.03013

Available at: <https://aisel.aisnet.org/cais/vol30/iss1/13>

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# Communications of the Association for Information Systems



## Government Regulation of Online Game Addiction

Jing Da Zhan

*Department of Information Systems, National University of Singapore*

*zjingda@comp.nus.edu.sg*

Hock Chuan Chan

*Department of Information Systems, National University of Singapore*

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### Abstract:

While the Internet has changed the world with online knowledge, communication, and collaboration, it has also introduced online addiction. Online game addiction can be severe with tragic outcomes. Most governments and organizations are yet to recognize the severity of online game addiction and the need for intervention. We briefly review the literature on online game addiction. We also summarize the limited attempts of governments to develop regulations aimed at preventing online game addiction. Special attention is paid to China and its efforts to reduce the number of hours that young people can play online. We present evidence suggesting that online game addiction is an issue that should be considered by governments everywhere and that information systems researchers can play an important role in analyzing the impacts of government regulation of online addiction and shaping regulation improvements.

**Keywords:** online game addiction, government regulation, addiction prevention

Volume 30, Article 13, pp. 187-198, April 2012

## I. INTRODUCTION

The Internet has greatly influenced our daily life. For example, via e-mail, MSN, blog, Facebook, and Twitter, we are more closely connected with friends in a digital way. We increasingly use the Internet for entertaining, learning, traveling, shopping, seeking medical advice, and gambling, and it seems that we need only a computer to gain access to the entire world. Although the Internet offers many conveniences, it has made many of us dependent on it, and some of us have become addicted.

According to a survey on American users' online behavior ["What Americans," 2010], people, on average, spent 23 percent of their time online "social networking" and 10 percent of their time engaged in "online gaming." In the U.S., over 900 million hours were spent monthly on social networks or blogs in 2010 ["What Americans," 2010]. By July 2010, Facebook, the world largest social network service (SNS) operator, had over 600 million monthly active users [Carlson, 2011]. Similar websites, such as Twitter, Myspace, Nexopia, and Renren, are also popular worldwide. In addition, Internet users spend large amounts of time on online gaming, i.e., playing games online. By 2007, the population of online gamers worldwide was about 217 million, approximately 28 percent of the total online population [comScore, 2007]. Online games are enjoyed by people of all ages, from children to senior citizens, with nearly half in the age range of eighteen to forty-nine [Entertainment Software Association (ESA), 2010]. In addition, the percentage of female gamers is increasing [Blockdot, 2010]. Hence, social networking and online gaming have become major activities for all types of Internet users.

The increasing popularity of social networking and online gaming has resulted in more and more people becoming addicted to these activities. This is now a social issue that concerns many families around the world. Online game addiction is prevalent in many countries, including China, Korea, Vietnam, Japan, U.S., and Canada. In South Korea, 2.4 percent of the population, ages nine to thirty-nine, were believed to be addicted to online games, and over 10 percent could be classified as obsessive gamers [Faiola, 2006]. China is also facing an issue of severe online game addiction among adolescents. The Chinese mass media is often filled with tragedies caused by online game addiction, and many parents have no choice but to send their children to clinics or specialized training camps to cure their addiction to online games. Online game addiction may result in students dropping out of school [Jacobs, 2010], disruption of friendships and family relationships [Griffiths, 2010], juvenile delinquency ["Vietnamese Boy," 2007], and even suicide [Kohn, 2009].

Excessive social networking may be one of the causes of Internet addiction. Social network addiction usually results in low work efficiency because employees spend a large amount of their working time on Facebook, Twitter, or similar websites [Karaiskos et al., 2010].

With so many undesirable and, sometimes, tragic outcomes caused by online game or social networking addictions, more and more sociologists, psychologists, medical scientists, information systems researchers, and computer scientists are investigating the factors causing these addictions and looking for potential cures. In this article, we first discuss the characteristics of online gaming addiction. Then the suspected causes of online gaming addiction are analyzed. After that, we summarize the major negative consequences associated with online gaming addiction and discuss government regulations pertinent to online gaming addiction. Finally, we put forward our suggestions for future research about government regulation of online game addiction.

## II. THE CHARACTERISTICS OF ONLINE GAME ADDICTION

Many previous studies [Grusser et al., 2006; Griffiths, 2010; Young, 2009] investigated the behavior of online gamers and found that addicts displayed some common characteristics, such as suffering from emotional problems, low self-esteem, poor communication ability, loss of interest, and social withdrawal. Some of these psychological problems are related to social environment or family background, and others are inherent individual characteristics. Researchers have found that some online game addicts stop going to work [Chappell et al., 2006], play online games at work [Yee, 2007], lie to families and friends [Young, 2009], forgo sleep and food [Ng and Wiemer-Hastings, 2005], show aggressive behavior [Anderson and Bushman, 2001], use gaming as an escape [Olson et al., 2007; Jacobs, 1986] and isolate themselves from the outside world [Williams, 2006]. Furthermore, severe online game addicts behave similarly to drug addicts in many ways, such as feeling mentally or physically sick when they are forced to stop playing [Young, 2009; Ng and Wiemer-Hastings, 2005]. Withdrawal symptoms such as these are well-known characteristics of addiction. In addition, game addicts may accidentally or even intentionally hurt family

members or unrelated people. Hence, online game addiction can result in behaviors similar to those associated with severe substance (drug or alcohol) addiction [Ng and Wiemer–Hastings, 2005].

According to the “components” model of addiction [Griffiths, 2005], addictions whether chemical addiction or non-chemical, consist of a set of distinct characteristics that include salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse (as shown in Table 1). Some researchers [Griffiths, 2010] have distinguished “excessive gaming” from game addiction. Both excessive and addictive gamers share the salience component, since both spend increasing amount of time gaming online. However, salience itself cannot sufficiently tell us whether a person is addicted to online gaming. True addiction is dependent on the degree to which all of these factors are present.

**Table 1: Characteristics of Addiction**

Components	Details	Components	Details
Salience	Online gaming becoming the most important activity in the person’s life	Mood modification	Subjective emotional experiences caused by online gaming
Tolerance	Increasing time spent on online gaming	Withdrawal symptoms	Unpleasant feeling from not playing
Conflict	Conflicts between the online gamer and those around him/her	Relapse	Tendency for repeated reversions to earlier patterns of online gaming

From Griffiths, 2005

Griffiths [2010] clarifies the difference between excessive and addictive game playing. Two online game players spent a large amount of time every day on gaming. However, the first did not show any characteristics of addiction, except salience. The second was deeply addicted to online gaming; it caused the breakdown of his relationships with his wife and children, and he lost his job because of his addiction to online gaming. He reported that he could not stop playing games and told the researchers that when he was playing online games, all his worries would disappear. The combination of these characteristics suggested that he was deeply addicted to online games, and playing online games had negatively influenced him and the people around him.

Gamers can be classified as pathological gamers and non-pathological gamers [Grusser et al., 2006]. Pathological gamers spend much more time on gaming than non-pathological gamers. Pathological gamers also have significantly higher “expected relief of withdrawal symptoms when gaming” and show higher “craving due to the expectation of a positive outcome of gaming” [Grusser et al., 2006, p. 291]. Hence, pathological gamers are more likely to be addicted to online gaming because they show several characteristics of addiction, such as salience, mood modification, and withdrawal symptoms.

Hussain and Griffiths [2009] propose that most online game addicts have psychological and behavioral dependence. Dependent gamers use games, such as MMORPGs (Massively Multi-Player Online Role-Playing Games), as a way of adjusting their moods. They show strong withdrawal symptoms, including feeling moody and irritable if gaming suddenly ceases. Furthermore, conflicts usually occur between dependent gamers and their families since they neglect their families. Overall, dependent gamers display several core components of addiction.

From analyzing comments from many online gaming forums, Chappell et al. [2006] found that novel characteristics and social interaction in online games can be very attractive to new gamers. However, when gaming gradually engulfs their lives, negative effects may result. Over time, online gaming would negatively influence their study and work and undermine their relationships with families, relatives, and friends.

### III. MMORPG—THE MOST POPULAR ONLINE GAME MODE

Why is online game addiction so prevalent around the world? What makes online games more addictive than other games? We address these questions using the examples of Massively Multi-Player Online Role-Playing Game (MMORPG), which are interactive online games [Kim and Kim, 2010].

MMORPG is the vanguard of a generation of computer games that take advantage of the accessibility of the Internet and the graphics-processing capabilities of personal computers [Yee, 2006]. It is also the most popular type of online games that are played by a large number of people of different age groups. In 2010, World of Warcraft (WoW), a popular MMORPG, had over 12 million subscribers [“World of Warcraft,” 2010]. It was the world’s most-subscribed MMORPG with a 48.9 percent market share [Cole and Griffiths, 2007]. Many other MMORPGs, such as City of Heroes (7.6 percent market share), Ultima Online (4.5 percent market share), EverQuest (4.1 percent market share), and Lineage II with 3.8 percent of the market, are also very popular among game players [Cole and Griffiths, 2007].



Cole and Griffiths [2007] suggest that nearly half of MMORPG players are student-age. Kim et al. [2008] observe that adolescents are more likely than adults to become addicted to MMORPG because they have lower levels of self-control and are more curious about MMORPG features. The veracity of Kim et al.'s assertions is supported by Chuang's [2006] study which showed that the mean age of MMORPG-addicted is about twenty.

Several studies [Hussain and Griffiths, 2009; Ng and Wiemer–Hastings, 2005; Yee, 2006] have shown that MMORPG has addiction-inducing features. Hussain and Griffiths [2009] identify six distinct characteristics of MMORPG: persistence, physicality, social interaction, avatar-mediated play, vertical game play, and perpetuity. First, every gamer in MMORPG controls an avatar. The avatar can take on different roles, such as a fighter, a physician, a business person, a farmer, or an entrepreneur. Each avatar is an important element in the virtual world, and the game's dynamic story is driven by these avatars. Second, the design of MMORPG is primarily based on the real world, with the concepts of space and time similar to those in real physical environments. Third, MMORPG is a persistent world existing independently of players. That means that even when the players log out, the story remains ongoing, driven by the computer system and/or other players. A feature that makes a MMORPG different from many other types of games is its embedded social interaction and social interaction is one of the key causes of online game addiction. Ng and Wiemer–Hastings [2005] suggest that perpetuity is another distinctive feature of MMORPG. In the MMORPG world, no final goal exists and the games are endless because the story of the game is collectively determined by every player. The end goal for individual MMORPG players is to make progress; this can be accomplished through activities such as earning experience points, fighting, and trading.

Cooperation and interdependence among game players are the most important features in many MMORPGs [Yee, 2006]. These features distinguish MMORPG from traditional game genres, such as stand-alone or local area network games like *Quake*, *Unreal*, and *Counterstrike*. Though local area network games also provide some channels for interaction among players, the scope of interaction is restricted geographically. In contrast, gamers in MMORPG can cooperate with other players anywhere in the world. "EverQuest" provides good examples of what can be accomplished through successful player-to-player interaction in a MMORPG. In order to accomplish high-level tasks in "EverQuest," players have no choice but to cooperate with one another because the tasks have been purposefully structured to be too difficult to be accomplished individually [Ducheneaut and Moore, 2004]. In other role-playing games like "Star Wars Galaxies," gamers are required to play different professions. They have to cooperate to earn their living by exchanging goods and services with one another in much the same way that professionals interact in real life. This enables MMORPG players to gain social experience while gaming in addition to having fun. Comparable levels of social experience may be unavailable to game players in real life because of physical restrictions.

Some online game players think that MMORPG provides them with an alternative to unsatisfied real-life needs or motivations [Hussain and Griffiths, 2009]. This is why many people prefer MMORPG over other types of games. Furthermore, strong and frequent interaction among game players within MMORPG may lead to strong friendships with fellow gamers.

#### **IV. FACTORS CAUSING ONLINE GAME ADDICTION**

Many previous studies have analyzed factors that cause online game addictions. Some researchers have proposed that social interaction is one of the most important factors causing online game addiction [Choi and Kim, 2004; Ducheneaut and Moore, 2004; Cole and Griffiths, 2007]. As mentioned above, social interaction in online games (e.g., *World of Warcraft*, *Second Life*) provides a channel for gamers to establish strong friendships and emotional relationships with one another. Games also provide communication venues and tools to facilitate social interactions among players. Many online games include virtual settings (e.g., trading market or battlefield) where players in the games meet or talk. Communication tools (e.g., community bulletin board or chatting box) are the channels provided for communication. An online game that has been designed to provide players a good communication platform will facilitate more social interaction among players during game sessions [Choi and Kim, 2004] and help ensure that the game will have a loyal following.

Addiction to online games may be influenced by game "flow" and human needs. Flow represents the user's perception of the interaction with the medium as being playful or exploratory [Trevino and Webster, 1992] and a flow state can be experienced or accomplished by playing online games [Wan and Chiou, 2006]. Wan and Chiou [2006] studied flow and needs as psychological motives of online gaming and found that the relationship between flow state and online games addiction is stable and consistent. This suggests that flow state may be a determinant of online game addiction. They also analyzed online game addiction in terms of need-motivation in humanistic psychology. Based on Maslow's hierarchy of human needs model, they reasoned that online game addicts may view online gaming as a "must" in their daily lives similar to how they view food, clothing, or sleep. When online gaming is viewed as a necessity to gamers, it is a symptom of addiction to online gaming. Stronger evidence of addiction exists when online game players feel unsafe or irritable when they are not allowed to play or if they feel mentally or

physically sick when they stop playing for extended periods of time. For non-addicts, online gaming is viewed as just another form of entertainment or relaxation. They exhibit none of the withdrawal symptoms because online games are not “musts” in their daily lives.

Another potential cause of online game addiction is the availability of different social experience within the games. Social experience differs from social interaction in that social experience emphasizes the individual experience in games. Suler [1999] suggests that people are inherently eager to experience life from different perspectives. Ducheneaut and Moore [2004] point out that some online games (e.g., Star Wars Galaxies and World of Warcraft) require players to choose an avatar of a particular profession (e.g., doctor, business man, teacher, or fighter). Avatars and their professions form the basis of the world system inside the game and each player’s avatar is, therefore, a key element of the virtual social community. In this way, players can enjoy a virtual social experience that may be unavailable to them in the real world because of social restriction or limited professional knowledge. This helps explain why playing online games may become an approach for addicts to escape from reality.

Real-life environment may also contribute to online game addiction. For example, a person may be more likely to engage in online games if his or her close friends are obsessed with online gaming. Jung et al. [2005] suggest that peer influence is positively related to the scope and intensity of Internet connectedness. Their study showed that about 80 percent of their respondents mentioned that they regularly received Internet-related help from friends. Family environment may be another determinant of online game addiction. Yen et al. [2007] propose that parent-adolescent conflict and inadequate parental supervision and discipline may be positively related to addiction to online gaming and other Internet activities among adolescents. Yee’s [2006] study showed that 26 percent of male players and 40 percent of female players participated in online games with other family members; this lends additional support for the notion that online game addiction may stem from real-life interpersonal relationships.

Interestingly, many online game players believe that online gaming is a good way for them to get to know more people and develop social networks [Ng and Wiemer–Hastings, 2005] and some prefer this way of building social networks to those available in real life [Hussain and Griffiths, 2009]. Some players subsequently date other players they have met online [Yee, 2006; Cole and Griffiths, 2007]. Some online game players think that their online relationships are more important and solid than their offline relationships.

## V. BAD EFFECTS OF GAME ADDICTION

Game addiction is associated with many health and social problems for game addicts and people around them.

### Bad Effects on Players

Adolescents are most likely to be online game addicts because they often have less self-control than adults and are typically more curious about new things. When first playing online games, players will have an experience of excitement, challenge, satisfaction, freedom, achievement, etc. Later, when online gaming takes over, disastrous consequences may ruin their lives [Chappell et al., 2006]. For example, online game addiction is related to non-attendance at school. In the United States, many college students report that their roommates and friends often skip meals and classes in order to have more time to play World of Warcraft. Online game addiction has also become one of the top reasons for college drop-outs in the U.S. [Jacobs, 2010]. Similar issues with online game addiction among young people have been observed in Asia. It is estimated that over 30 percent of middle school students in Hong Kong show symptoms of online game addiction. In Singapore, 9 percent of gamers are believed to be addicted to online gaming, using standards similar to those developed by the American Psychiatric Association (APA) for diagnosing gambling addiction [“9 Percent of Kids,” 2010]. Lower levels of academic performance among students addicted to online gaming have been observed in Hong Kong and Singapore.

Online game addiction also contributes to failing health for gamers [“Online Gamers Are,” 2008]. Because excessive online gamers typically sacrifice sleep because of long hours in chat rooms and sitting in front of computers, they are more likely to have elevated frequencies of headaches, backaches, cervical disease, eye strain, seizures, and repetitive stress injury [Chuang, 2006; Young, 2009]. Online game addiction may also be associated with mental illnesses such as depression, nervousness, fear, social anxiety, and social phobias [Lo et al., 2005; Griffiths, 2010]. Chan and Rabinowitz [2006] found that playing Internet video games may also exacerbate attention deficit hyperactivity disorder (ADHD) and inattention symptoms in adolescents. In the United States, online game addiction has been added to the APA’s list of addictions. This led to the creation of the first self-help Online Gamers Anonymous group in 2002 as a mechanism for providing ongoing treatment and support for online game addicts. In China, the first officially licensed clinic for Internet addiction was established in Beijing. Almost all the patients in this clinic were teenagers who were sent by their parents [“Beijing Clinic Ministers,” 2005].

In some instances, excessive online gaming has been a cause of death. A twenty-eight-year-old South Korean man is reported to have died from heart failure due to continuously playing games at an Internet café. The man did not sleep properly and ate very little food during his marathon gaming ["South Korean Man," 2005]. In 2007, a Chinese man in Guangzhou suddenly collapsed after playing an online game for three days. The doctor said the cause of death was "exhaustion" [Thomson, 2007]. Another tragedy happened to an "Everquest" player who committed suicide. He was completely obsessed with the game, could not stay away from it, and was extremely upset because something bad happened to his virtual character in the game [Kohn, 2009]. In the United States, a woman sued Nintendo because her son suffered seizures after playing video games and died after a seizure; she alleged that her son never had seizures before becoming a Nintendo-64 player [Berghammer, 2002].

### **Bad Effects on Families and Society**

Online game addiction may lead to aggressive behavior, whether intentional or unintentional. Because some online games are filled with violence (e.g., Harvester and Soldier of Fortune), sexual themes (e.g., Mass Effect and God of War), blood (e.g., Lula 3D and Riana Rouge), alcohol and drugs (e.g., Driver Series and Grand Theft Auto Series), and strong language (e.g., Fallout3 and Midnight Club) [Anderson and Bushman, 2001], players, especially adolescents, may be influenced to imitate such bad behavior [Williams and Skoric, 2005]. Sometimes gamers show bad behavior toward family members. For instance, a north Florida mother was charged with killing her three-month-old baby because the baby's crying made her irritable when she was playing a popular social networking game ["Jacksonville Mom Shakes," 2010]. In February 2010, a twenty-seven-year-old American nearly killed his mother because she tried to stop him from playing World of Warcraft [Morbid, 2010].

Online game addicts may purposefully hurt other players or innocent bystanders. In 2005, a Shanghai online gamer killed a fellow gamer because this fellow gamer had sold a virtual sword borrowed from him ["Chinese Gamer Sentenced," 2005]. In November 2007, a thirteen-year-old Vietnamese boy murdered and robbed an eighty-one-year-old woman for money to play online games ["Vietnamese Boy," 2007]. Other criminal and anti-social behaviors may be caused by online gaming addictions. Students are mostly likely to commit online game-related crime, with over 70 percent of criminals between fifteen and twenty-five years old [Chen et al., 2005]. In Taiwan, the number of thefts, fraud case, robberies, threats, and sabotages influenced by online games has increased significantly since 2001 [Chen et al., 2004].

Online game addiction may also lead to property crimes. For example, in Gansu Province, China, a local policeman caught a resident stealing in a greenhouse [Jin, 2010]. The criminal said that after playing "Kaixin farm," a popular online game in which virtual characters gain status through theft, he felt it would be more exciting to steal vegetables and fruits in real life.

## **VI. CURRENT REGULATIONS**

The governments of many nations have introduced game ratings to reduce the chances of inappropriate game content reaching young people. Unfortunately, few nations are regulating online game addiction. The online game content rating systems developed in Europe and the United States are widely used. The Pan European Game Information (PEGI) and Entertainment Software Rating Board (ESRB) have been created to regulate the content of game products. These require game products to display content symbols and advisory warnings that include an age recommendation and a description of the type(s) of content included in the game (e.g., violence or criminal behavior). All games are required to attach content and age-level labels on the package so that buyers can see whether the game is suitable for them or their children. In addition, sellers are forbidden from selling games to inappropriate consumers such as minor children.

Pan European Game Information (PEGI) is a European video game content rating system. Over thirty countries have adopted the PEGI system, including thirty-one European countries, Israel, the United Arab Emirates, and South Africa. In 2007, the PEGI Online division was formed, and online games now carry an additional "PEGI online" logo on the back of the packaging. This logo is intended to advise consumers that it is possible to play the game online, which may create different risks than if it were played offline ["Safer Children in," 2008]. The PEGI online system gives licenses only to "online game service providers" whose online games do not include illegal or offensive content. By August 2010, PEGI had rated over 15,000 games ["Pan European Game Information," 2011].

In North America, the Entertainment Software Rating Board (ESRB) rates computer and video games in Canada, the United States, and Mexico. Although it is technically voluntary to submit game products to be rated, by 2009 the ESRB had rated nearly 19000 titles ["Entertainment Software Rating Board," 2011], because unrated video games are usually not accepted for sale by most retail stores and console makers. However, ESRB has been blamed for under-rating games such as Manhunt and Soldier of Fortune, which contain violence. Many critics have claimed that

the ESRB would rate games AO (Adult Only) only for sexual content, ignoring high levels of violence [“Entertainment Software Rating Board,” 2011].

Although these rating boards rate game products and strive to prohibit sellers from selling inappropriate games to adolescents or young players, some video game shops treat these regulations only as advisory and still sell products to individuals whose age is less than the rated minimum [“Safer Children,” 2008]. In addition, the boards cannot prevent children from getting inappropriate game products through unsanctioned distribution channels. For example, adolescents may play online games rated for adults with older siblings, or they can also get older people to buy game products for them.

China is one of the few countries that have tried to develop regulations to prevent or reduce online game addiction. Their Ministry of Culture (MoC) and General Administration of Press and Publication (GAPP) have assumed responsibility for online game censorship. In 2007, GAPP, along with seven other governmental agencies, jointly promulgated the implementation of Online Game Anti-Addiction System, which aims to curb online addiction [“Online Gaming in,” 2011]. It requires all online game service developers to monitor users’ playtime. This system has two main purposes. The first is playtime censorship, and the second is identification (ID) checking. Under this system, minors (under eighteen) are restricted from playing online games for more than three hours a day. If they attempt to play more than three hours, the service provider is required to limit their ability to continue playing, either by turning off in-game reward mechanisms or stopping play. This system was formally put into practice on July 16, 2007. Games that were developed and distributed before that date were required to make the changes needed to bring them into compliance [“Online Gaming in,” 2011]. Any games that did not include the embedded anti-addiction mechanisms were required to put them in place prior to the July 2007 implementation date.

The Online Game Anti-Addiction System (OGAAS) appears to have had some positive effects. According to a national survey by the China Youth Social Service Center, the number of Chinese online game players under the age of eighteen declined to 15 percent by 2008—a 7 percent drop from the 2007’s figure of 183 million [“Anti-online Game,” 2009]. However, there are still many obstacles to fully implementing this system. Two weeks after the announcement of the regulation, GAPP reported that twenty-nine online games had failed to install the checking system. Accordingly, GAPP sent a warning to twenty online game service providers who had not adopted the anti-addiction online system and required them to implement anti-addiction system for their games to avoid further government scrutiny [“Game Operators Receive,” 2007].

In OGAAS-compliant systems, players have to input their ID number and real name to login. However, many stakeholders have argued that it does not prevent children from using their parents’ or other older people’s IDs. Since it cannot effectively prevent minors from gaining access to online games, obsessive players can find ways to get around login and time limit restrictions. Also, children can switch accounts or switch among different online games in a day to bypass time limit restrictions.

In March 2010, China’s Ministry of Culture announced the “Online Games Temporary Regulations,” which took effect on August 1, 2010. This regulation was designed to be a set of comprehensive rules to regulate the overall online games industry. Under these regulations, online games should not include gambling, pornography, or violence. In addition, they should not abet crime, promote cults or superstitions, or any kind of content that erode social mores or violate laws. The regulations forbid allowing underage players to use virtual currency published by game operators to pay to play online games. It also requires new players to register using their real names and ID numbers. However, because this regulation has comprehensive rules that cover many aspects of the online game industry, it is not directly aimed at preventing minors from becoming addicted to online games. Therefore, its success in reducing online game addiction is yet to be observed.

Too often, Internet café operators help customers who are minors register for online games using their own IDs. In addition, some small- and medium-sized game operators are working hard to find direct login methods that bypass registration procedures [Lan, 2010].

In sum, although online game regulations have been developed and implemented, their effectiveness is questionable because there are many loopholes and inadequacies. Many parents are not satisfied with the adequacy of measures, but they think it is better than nothing. Many players are indifferent to the regulations, because they can still gain access to the online games that they enjoy playing. In addition, although the regulations include many restrictions for online game operators, it cannot promise that these operators will obey the regulations.

## VII. CONCLUSION

Although many measures (e.g., content labeling and age-rating of game products and restricting access to online games via ID checking) have been developed to prevent online game addictions, their effectiveness is questionable. Because of loopholes in existing regulations, children and adolescents can still find ways to play online games that are inappropriate for their age. This means that online game addiction remains as an important social issue that must be addressed. In the following paragraphs, we present several constructive suggestions focused on government regulations that may help reduce online game addiction.

### Government Regulations

Although steps have been taken by governments to address factors that contribute to the development of addiction to online games, most are not highly effective. As a result, governments are obliged to take additional steps to curb online game addiction.

Children usually play online games after school and on weekends. Accordingly, one effective preventive solution could be adopting “curfews,” which prevent children under certain age levels from playing online games overnight. The Vietnam government has implemented measures that block access to online games from 10 P.M. to 8 A.M. every day. Specifically, the Vietnamese government monitors online game activities and sanctions organizations that violate these regulations [Alexander, 2011]. In South Korea, the National Assembly is considering adopting a similar curfew that would automatically block online game connections at midnight [“South Korea Online,” 2011]. Although this would negatively affect the profits of online game services, it has the potential to be a major step toward preventing online game addiction.

National governments also need to educate parents about online game addiction. Too often, game addiction among adolescents results from parents neglecting their childrearing and supervision responsibilities. Governments can help by clearly defining parental obligations in the prevention of online game addiction. Specifically, governments need to raise parents’ awareness of online game addiction and its negative effects. Parents may not know how to protect their children from becoming online game addicts, and government guidance may be necessary. For example, governments should be proactive about informing parents about online game rating systems and how to know if inappropriate online games are installed on the home computers or laptops that their children use. Guidance on checking browser history logs to see the trajectory of Web surfing should also be provided. Most importantly, government agencies, businesses, and universities organizations should research and advocate the forms of family communication and behavior that are most likely to prevent children from becoming online game addicts.

Adults, as well as children and adolescents, may become addicted to online gaming, and the negative consequences of adult online game addiction are frequently more wide-ranging than those for children and adolescents. Online game addiction among adults is more likely to result in negative effects for themselves, their family members, fellow workers, and even people they do not know. This means that government efforts to regulate adults’ game addiction is likely to be very challenging. As previously mentioned, online game addiction can result in consequences that are as severe as chemical addictions. Hence, it may be helpful to adopt approaches used to treat drug addiction to treat online game addicts, especially adults.

In Europe, the first clinic for game addiction was set up in Amsterdam [“Videogame Addiction,” 2006], and, during the treatment period, patients are not allowed to access computer games. The clinic uses therapy groups, consisting of psychologists, psychiatrists, and therapists, to identify replacement activities to help patients forget gaming. Similar online game addiction clinics have been established in China, Japan, and the United States. More national governments should move toward establishing clinics dedicated to treating online game addicts. They should also devote more resources for overseeing online game services and implementing regulatory mechanisms likely to prevent or reduce online game addiction.

In short, governments need to be proactive in preventing online game addiction. The increasing prevalence of online gaming as a popular form of entertainment is making it more urgent for governments to establish relevant and specific regulations and laws aimed at preventing online game addiction.

### Research on Online Game Regulations

Many previous studies have been only general investigation of online game addiction, such as the characteristics of addiction, potential causes of addiction, and negative consequences of addiction. Few previous investigations have considered measures to solve or prevent online game addiction. Since existing regulations have not been as effective as expected, national governments are challenged to develop more practical and feasible regulations and laws to address online game addiction. This means that more research on government regulation of online game addiction is needed.

There are several key areas where future research on government regulations and laws on online game addiction are likely to be fruitful. First of all, it is important to focus on the loopholes or shortcomings of the government regulations that are in place. Looking at existing inadequacies and unintended consequences of current regulations is important for identifying opportunities for improvement. For example, many current regulations have established game rating systems (e.g., PEGI and ESRB) that are aimed only at regulating the production and distribution of videogames and/or online games; as such, they are limited in their efforts to prevent online game addiction. As noted previously, there are obstacles that make the implementation of these regulations inefficient and ineffective. Therefore, researching the shortcomings of current regulations and laws should be a focus for future research.

Second, from the foregoing discussion, it should be quite clear that online game addiction is a complex social problem that involves many stakeholders, including game producers and vendors, ISPs, Internet café owners, game players, and parents. Future studies should take a closer look at the responsibility of each stakeholder in causing and/or preventing online game addiction and should investigate approaches to improve current regulations in terms of each stakeholder's roles.

Further research should not focus solely on online game addiction, but should also encompass other forms of online addiction, such as addiction to online social networks. The increasing popularity of numerous social network sites (SNS), such as Facebook, Twitter, and mySpace, has led to behaviors similar to those displayed by online game addicts, such as spending inordinate percentages of their daily lives online checking or updating their accounts and communicating with others [Pamoukaghlian, 2011]. A closer look at the similarities and differences between online game addiction and other forms of online addictions is likely to provide additional insights into the roles that governments can play in addressing these increasingly urgent social issues.

## REFERENCES

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## ABOUT THE AUTHORS

**Jing Da Zhan** has a B.A. from Nanjing University. He is a graduate student at the National University of Singapore. His research areas include game addiction and macroeconomic impact of IT.

**Hock Chuan Chan** has a B.A. Hon. and M.A. from the University of Cambridge and a Ph.D. from the University of British Columbia. He is an associate professor at the National University of Singapore. His research areas include information system acceptance, user-database interaction, and spreadsheet visualization. He has published in journals such as *ACM TOCHI*, *IEEE TPC*, *IEEE TEM*, *IJHCS*, *ISR*, *JAIS*, *JDM*, and *MISQ*. He was a program committee member/track co-chair or AE of the following conferences: ICIS, PACIS, and HCI/MIS Workshop. He is on the editorial board of *AIS Transactions on Human-Computer Interaction*, *Journal of the Association for Information Systems*, *Journal of Database Management*, and *Journal of Electronic Commerce Research*. He was an Associate Editor for *MIS Quarterly*.

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