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# An Empirical Study of the Moderating Impact of Peer Group on Key Business Antecedents and Digital Games Performance of the Indian Economy

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## Abstract

The digital games sector has emerged to be a creative, dynamic, and exciting sector in the past few decades in India. The digital game industry has a major contribution to the Indian economy as this industry has triggered the sale of other related products. The digital market is expected to continue mounting in the future, driven by innovative advancements and an increase in the number of players. The Internet expansion has driven phenomenal growth and an industry that is worth billions of dollars. This study contributes significantly as it empirically investigates the impact of business antecedents on the business performance of the digital games sector. It will help provide the games development organizations with the perspective on how players really think and make decision regarding their selection of online games. This study tested the relationship between key business antecedents and digital game performance. Identified antecedents such as awareness of players regarding digital games, duration of the digital games, innovation in digital games, user interface, reputation of the digital games, have been found to have significant impact on the two aspects of digital games performance i.e., players' satisfaction and players' willingness to play again. Furthermore, the study also identified the role of peer group as a key moderator between player's satisfaction and player's willingness to play games again.

**Keywords:** Online Gaming, Moderation, Peer group, Satisfaction, Willingness to play again
**JEL Classifications**: L1, E02, O47, C93, M31

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## 1. Introduction and Purpose of the Study

The market value of the gaming industry was around $90 million in 2020, and this is estimated to go up to $143 million rupees by 2022. The global consumer survey worldwide for video and market segment by Statista (2021), indicates that individuals whose ages are between 25 and 34 years comprised the largest group of video game players, of which 36.4% and 61% video game players were females and males, respectively. According to the report released by the Entertainment Software Association (ESA), the gaming industry in the United States produced $90.3 billion in annual economic activity in 2019, supporting nearly 429,000 jobs (ESA, 2020). The digital games industry had a major effect on the economy in the United States, including job growth and family-sustaining employment in a wide range of related occupations. The digital games industry has been one of the fastest growing industries, contributing majorly to the Indian economy. The industry has been evolving at a rapid rate in the country, and analysts predict over 40 thousand job opportunities by 2022 (Statista,2021a). According to the Economic Times (2020), PM Modi stated that in order to meet global standards, the focus should be on technology and innovation, rather than manufacturing digital games apps. The statement positioned games about Indian culture and values within the border strategy of "Ek Bharat, Shrestha Bharat"-an initiative started by the Modi government in 2015 which was aimed at promoting national pride by celebrating the traditions and history of India's States and Union Territories.

Indian digital gaming market is segmented into mobile gaming, computer gaming and console gaming on the basis of the medium used for playing games. Mobile gaming holds the largest share of the market, yet there is very little research done in the Indian context. In the Indian context, the strategic games which are played mostly are Clash of Clans, Counter Strike, PubG, Call of Duty etc. On the basis of game downloads, Supercell, Elex Technology, Gameloft, Octro & Zynga Game Network are the major mobile game providers in India.

Video games are defined as the approach to interaction between the player, a machine and an electronic visual display, and possibly other gamers, which is mediated by a significant fictional context and is sustained by emotional attachment or passion, and are extremely popular worldwide (Cudo et al., 2020).

One of the major growth factors for online gaming has been the fact that India has the second highest smartphone ownership in the world. The ownership of smartphones is on the rise every year. It has been found that an average smartphone user in India spends about 4.2 hours per day on online gaming apps (TechCrunch 2021). Technology plays a key role in increasing the pace of growth of the Indian gaming industry. Due to recent advancements in technology, many of the latest new games are unbelievably life-like and attractive to users. As a result, in the last few decades, the digital games sector has emerged as creative, appealing, pervasive, and particularly exciting. Digital games organizations have long been looking at ways of improving existing user experiences and updating business models.

The current research is set in the context of the performance of digital games. The objective of this study is to analyze the relationship between the antecedents such as awareness of players regarding digital games, duration of the digital games, innovation in digital games, user interface (i.e., convenience of the players), reputation of the digital games, cost (i.e., price charged by the players for playing the game), and two aspects of digital game performance (i.e., players' satisfaction and players' willingness to play again).

This study is a pioneer in the sense that it demonstrated the inter-relationship of key business factors and game performance in the Indian context.

The study also focuses on the concept and role of peer groups. Hence, the moderating impact of peer group on antecedents affecting digital game performance and the aspects of digital game performance has been empirically tested. This study would be of immense benefit to digital game marketing managers/organisations as it would help them to get a perspective on how players really think and make decisions regarding their selection of digital games.

The results of this study provide evidence that games development organizations may comprehend and use to remain competitive. Furthermore, the results support the theoretical assertion that key business factors play a substantial role in game business performance.

## 2. Literature Review

An individual's tendency to exhibit preferability and subsequent repetitive behaviors of purchase for the preference towards games is an attitudinal deterministic approach (Price, 2019). To differentiate true loyalty and false loyalty, we must consider the effects of antecedents, such as feelings, awareness, duration for which the game is played, innovation, peer influence etc. (Price, 2019). An extensive discussion has explained the presence and popularity of digital games (Henderson, 2005; Oblinger, 2004). In the context of digital game organizations, antecedents that play a pivotal role in the game's performance have been identified through an extensive literature review. These factors have been described in detail as follows.

### *2.1 Awareness*

The classical understanding of the term "awareness" is that knowledge that is the result of an interaction between a particular agent and its relevant environment. Awareness simply means knowledge of what is going on (Endsley,1995). The core ideation of awareness involves dynamism related to perception, and action as well as an inherent state of knowledge about the process. Game Awareness refers to the strength of a game's presence in the players' minds. Awareness has found to have a significant impact on the digital games' performance.

Gamers, who are more aware, are more keen to enjoy new products related to gaming (Kim & Lee, 2017). A mobile gamer's epistemic curiosity affects the player's intention of continuously getting involved with the game. Several researchers highlighted aspects of the awareness levels of the product, such as customer's awareness regarding the detailed information about how they can make use of the product. In addition to this, customer's awareness regarding the process of using the gaming product also represents a significant know-how from the customer's side (Endsley, 1995a).

In the context of the present research, awareness can be interpreted as the information available to gamers before indulging in the experience. Primarily, four characteristics have been discussed to understand awareness (Endsley, 1995b), which are:

a) Information related to the environment with respect to time and space of the gamers.

b) Since the external environment is dynamic, knowledge must be maintained and updated at regular intervals.

c) The gaming environment is a real time interface, therefore information appraisal should foster the interaction process.

d) Awareness must become a facilitator and therefore help in the fulfilment of the achievement of environmental experience.

By being aware, people exhibit the knowledge of how and at what pace the environment around them changes. It also paves the way for the need of the gamers to be abreast of the upcoming opportunities (Ormsby et al., 2011). An in-depth investigation has led to the literature support that awareness and know-how about digital devices and the understanding of their functions have a significant impact on the impression youth carry about games (Ling, 2004; Heim et al., 2007; Hope Cheong, 2008; Campbell, 2007). Having more awareness made respondents eager to own or want some specific digital devices. It also led to boasting about the possessions, specifically about recent developments (Hundley & Shyles, 2010).

Also, it has been found that teenagers also synchronously learn from the media to gain social acceptance (Camponovo & Pigneur, 2003). Shared involvement through social media interactions thus encompasses several aspects of the gaming environment, such as co-habitation, preparing collaborative battle strategies and also being aware of the popular facts and features of games they are interested in (Camponovo & Pigneur, 2003a). In the present context, social networking sites plays a significant role in increasing social connections as a result of which gamers usually know and are updated on the latest gaming devices, features, perceptions, and popularity (Ling, 2004a).

As a result of gaming experiences, an enhanced level of players' cultural awareness has been observed.

### *2.2 Duration of the Game*

The duration for which players are engaged in the game depends on several factors. An integral role is played by the level of skills that competitors have. In cases where co-players have comparatively lower skill levels, enjoyment can be higher. On the contrary, they might have lower arousal levels post- experience of the game (Liu et al., 2017). More effort is expended while playing with equally skilled players, and the duration of the game is relatively longer than the average. There are various other nuances pertaining to intriguing factors that become imperative in determining the time and interest generation of players. In terms of competition level, features that interest the players, regular updates and several times gaining coins or additional game money credited by the gaming brand lead to an increase in the duration of the game play. A close relationship has been observed in the literature between enjoyment and flow. Enjoyment has been understood as the outcome of flow (Nah et al. 2012; Csikszentmihalyi, 1997). As a subset of the process of flow, a feeling of indulgence happens that entails 'happiness' (Csikszentmihalyi, 1997a). Hence, higher levels of arousal, happiness and indulgence all contribute to an increased duration of game involvement. Also, there is an expectation that when players have a good match between equally skilled players, additional support is rendered towards the emotional responses like enjoyment, arousal and duration.

Numerous game theorists have explored and elaborated on the concept of flow vis-à-vis the ideation of digital games (King & Krzywinska, 2006; Carr et al., 2006; Juul, 2011). It corroborates between the core aspects of game design, and the relevant characteristics of the players. It creates a linking pin between certain pre-defined goals, the challenges that players face in adjusting their skills and their corresponding feedback about their experiences. All these things together invigorate and prove to be antecedents to experiencing flow (Alexiou et al., 2012).

Gamers are theorized on the basis of the following process of getting absorbed in the game: 1) by generating feelings of immersion, even if it is termed as transportation. In this state, the player gets absorbed in playing without any apprehensions or disbelief.

It helps in the creation of a sense of affection for the characters and also has a personally relevant feeling of oneness with the game and its players; 2) by establishing flow, the player experiences a balance between various challenges of the game and the required skills etc., and, thereby, is in the state of high concentration; and 3) Gamers have the desire to master, feel connected, be in control, feel indulged, can fantasize and feel arousal as a result of the changing tasks at hand. By fulfilling all of these, it feels like being involved in the game for a longer duration (Kapp, 2012; Razak et al., 2012). The longer the players indulge in it, the more they gain knowledge about the upcoming features, and spend more time on exploration and enjoyment.

Thus, the duration of the game should be neither too short nor too long. An explanation for this is that too short a game does not allow players to indulge and hence learn out of it, whereas a longer duration makes the game less exciting and monotonous (Browne & Maire,2010).

### *2.3 Innovation*

Today, it's possible to play a game for days at a time and never come across the same scene or landscape twice. All this is possible due to continuous innovation in gaming apps. Innovation mainly occurs due to the constantly changing needs of gamers. Cumming (1998) defined innovation as "the first successful application of a product or a process". Innovation has started to achieve the status of the most important strategy that distinguishes the levels of competitors in the prevailing market. Innovation certainly has achieved to be proven as a determining factor for the pride of game developers (Bruns,2013).

In the digital gaming industry, businesses seek to explore new ideas and that is considered to be a sought after and pragmatic methodology for capturing a new audience. They seldom weigh their success in terms of their expenditure on quality differentiation. Therefore, innovation gained the new status of being something that everyone must strive for (Peltoneimi,2009). "The game industry is characterized by growth, volatility, and opportunities, and competition is kept alive by non-interoperability of the hardware (Williams, 2002)". Innovation delves into operations related to numerous companies that operate with high turnover in the gaming industry (Peltoneimi, 2009a). Therefore, innovation has served to be the core business value component that is imperative for companies to foster change, endeavour to stand out amongst several competitors in the gaming industry. Tschang (2003) opined that, it is merely through the act of simulation that game developers strive to create attractive and appealing products that interest game players. Also, such products become an inspiration that intrigues resonance within the players' minds.

From one perspective, innovation can be understood as the collaboration that some specialized individuals possess as an expertise and simultaneously, they need to face the challenge of coordinating with like-minded groups of game players and experts (Leonardi, 2011; Carlile, 2004; Bruns, 2013a). The entailing challenges emphasize and put the brunt on the dire need to revisit the already existing theoretical concern about an unpredictable but dynamic process of innovation and the various forms of coordination that can be utilized to organize that process (Chen & Nath, 2004). They proposed that coordination, in its conventional form, involves several aspects like the application of some pre-defined standards and norms, and the modularization of activities that have often been expected as needed when facing new challenges (Adler, 2005). This has motivated a broad theoretical concern which is centred on how emergent action coordinates work in organizations (Chen & Nath, 2004a).

Especially in the case of digital gaming industry, innovation has recently been considered as the prominent driver to foster market competitiveness and, thereby, economic growth**.** In order to achieve better economic performance nowadays, several forms of innovation have become critical**.** Innovation can be better explained in terms of exploiting new commercial ideas that have social acceptability**.** Finally, if companies are in a position to successfully introduce these new ideas into the existing gaming market, that eventually helps in improving the existing customer experience and hence improving the overall profitability of the gaming provider **(**Afuah, 2009**).**

### *2.4 User interface (UI)*

"The user interface (UI) is the point at which a computer, website, or application interacts with humans". A significant purpose of a good user interface is to make the experience of users simple and intuitive. This often requires the least amount of work from the gamer and thereby facilitates maximisation of the desired result.

An interface is one of the closest thing to a gamer. In the real sense, that is what gamers experience, have true feelings about, through their sense of hearing, visuals, and even interaction with the features of games, often called control systems. Though it always seems important for game developers to be well aware and have a clear idea about what kind of interface a particular game system provides. In cases where this isn't fulfilled, such a gaming experience will prove to be an inadequate and worthless challenge. Games, while being played, emerge from the core dynamics of the exquisite gaming technology used (Hunicke et al., 2004). Therefore, games are a set of diverse applications. These clearly have the goal of differentiation of the gaming experience rather than only superficial productivity.

Gaming experiences primarily depend upon the impact of the decisions pertaining to their design. The users' experiences, generally measured in terms of traditional usability matrix, have been observed as a relevant gamut for evaluation and to understand the consequences. Two significantly applicable factors, i.e., immersion and the flow experience, have emerged as a result of an in-depth literature survey on digital gaming. Both the above-mentioned factors appear relevant to describing and potentially measuring the holistic concept and feeling of 'gameplay' that both game developers and reviewers very frequently focus upon and refer to. This comes in handy when the gamers' interactive experiences have to be discussed in terms of interface, content and overall judgement (Johnson & Wiles,2003).

Consistently, though they might be consciously or unconsciously, gamers evaluate the performance of games. Their relative performance in games gets checked while they are approaching the desired goals and gearing up for the completion of the challenges. Through these basic steps, gamers try to abide by the choices and the game rules. It helps them to pursue new goals, peruse decision-making for winning strategies and earn rewards as motivation (Johnson & Wiles,2003a). As an achievement for reaching the desired goals, as a result of overcoming obstacles, a sense of competence and positive feelings emerge. Additionally, the spaces that generate curiosity are the ones that draw the gamers' focus towards the world of the respective game and allow players to find an escape from their real world. There is a feeling of being engrossed in the events of the game (Chen et al., 2015). Therefore, the game creation process is supported by the interface that has been developed. This also defines the limits of social as well as physical interactions that happen in the game. The interface facilitates discovery, exploration, and collection of new and exciting things in the gaming environment.

There exists a plethora of games that are available. These may pertain to the genres of adventure, role-playing, strategy or any other. These cater to information that

can help solve problems while simultaneously presenting a wide range of possible actions and interactions that allow the user to choose from them. The development of adaptive user interfaces allows organizations to apply some software applications to be able to solve a certain set of problems (Iba et al., 2000). In a particular game that could reach a wider audience, there would be the availability of several control options and multiple menus. These would be prospective products that the gamers would like to choose. Alternatively, some intelligent software approaches help in combating difficulties while executing strings of commands that might be of help during gameplay (Iba et al., 2000a).

### *2.5 Reputation*

Reputation means the goodwill a gaming app enjoys in the minds of gamers. Over the years, it has become evident that gamers prefer and exhibit their loyalty towards games that have a good and heathy reputation (Lu &Wang, 2008; Hsu & Lu 2007; Chang et al., 2008; Baek et al., 2007). The reputation of games emerges from five key elements. These are: the appeal of games, level of competition, competition conditions, emotions and behaviour of players, and privacy.

When players do not have any previous experience with a business, they prefer to consider judgements made by others and even recommendations. These form "reputation judgments" that are shaped on the basis of recommendations made. This is when gamers flock to review sites and play store recommendations and reviews. It becomes noteworthy here that "Reputation is the key asset of any organization, delivering the capability to "differentiate the business and create competitive advantage" (Gligorijevic & Leong, 2011), while providing the company with "the continuing trust and confidence of customers, investors, suppliers, regulators, employees and other stakeholders", and building online reputation as an essential marketing tool in the digital games industry. In the current study, "reputation" has been studied as a unidimensional construct wherein the effect of brand reputation is tested for having an impact on player's satisfaction and willingness of players to play again.

### *2.6 Cost*

When game developers evaluate the insights on choices relating to cost-effectiveness and time- efficiency, adequate knowledge about the existing market scenario becomes imperative. This information can be used to gain knowledge about traditional methods, market viability, and genre acceptability in specific cases (DeSmet et al., 2014). Players of educational games seem more willing to spend more on various upgrades. (Bourgonjon et al., 2010; Squire, 2005). Furthermore, cost effective strategies also recommend adoption of computer-tailored interventions, to be able to overcome players' concerns regarding lower expectations and reach. Another factor is looking at visual attractiveness and the increased level of interactivity provided to gamers (Crutzen et al., 2008; Crutzen et al., 2011). These have to be combined with a fun aspect that is also intrinsically motivating for players (Ritterfeld et al., 2009). Regrettably, this often proves to be an irrelevant determinant because of a weak causal relationship between behaviour change and knowledge about the gaming technique (Bartolomé et al., 2011). The effect is promising. Unfortunately, the effect on behavioural intention at follow-up measurement was substantially reduced, as was the case for self- efficacy, which is another determinant with a strong association with behaviour change (Bartolomé et al., 2011a). Games, therefore, are thought to provide a significant impetus to opportunities to increase enactive possibility and effectiveness (DeSmet et al. 2016).

### *2.7 Peer group*

Peer group is thought to be a significant factor influencing player satisfaction, as well as willingness to engage with the games again (Setterstrom & Pearson, 2019). The digital games sector has demonstrated itself to be one of the most popular and successful sectors to integrate the internet into its business models.

The social world in which a human being lives brings with it that very nature of influencing and getting influenced in one way or the other (Cialdini and Goldstein, 2004). Bem (1972) pointed out in his discussion that human's cognitive processes are highly subjective in nature. Peer influence is not due to coercion, but rather humans alter their attitudes and beliefs for psychological reasons (Lichtenberg, 1996).

Peer group has a substantial and significantly positive effect on customer (gamer) satisfaction which has been established upon studying extant literature review. However, peer groups have never been established as moderators in the context of digital games sector in India.

Smith et al., (2005) proposed that individuals who make purchases do seek peer validation from friends, family, etc. They have argued this behaviour is also due to feeling overwhelmed by too many options available to them (Olshavsky, 1985). Wu and Liu (2007) confirmed this with the help of the Theory of Reasoned Action to examine the antecedents that predict a gamer's intentions to play online games. Subjective norms can be deciphered as those meanings that are related to important people's perceptions of what they will think of them. This matters a lot (Pacaon et al., 2018).

In the current study, the researcher has studied the role of peer pressure as a moderator between key business antecedents (as discussed above) and digital game performance.

### *2.8 Player's Satisfaction*

Previous studies have considered that overall satisfaction is primarily a function of emotional and cognitive function (Giese & Cote, 2000). In the case of digital games, it is the cognition and emotional response after the online game consumption that is important. Player satisfaction is defined as the feeling of pleasure after comparing the product's performance with their prior expectations (Keller & Kotler, 2015). Leverin & Liljander (2006) defined satisfaction as the evaluation which is overall evaluative of the total consumer experience. The concept of customer satisfaction, even though it has drawn a good amount of attention amongst researchers, remains a total with very limited literature.

Satisfying consumers (gamers) have been and will always be of central focus of all gaming organizations due to its effect on profitability. Profitability is the ultimate goal of any organization (Greenwell et al., 2002; Liu and Jang, 2009).

A majority of studies show that if customers are satisfied, they want to engage more with the brand and, furthermore, become loyal customers. This may also result in them giving more publicity to the brand (Hasan et al., 2020). On the other hand, if consumers are not satisfied, they may not further their engagement with the brand and may even not return ever due to bad memory of having used that brand. In the present study, the researcher has explored player satisfaction as an overall component, as that has helped the topic be explored in a more practical light.

### *2.9 Player's Willingness to Play Again*

A player's willingness to play again is defined as the on-going willingness to show engagement with the games (Nacke et al., 2010). Players' willingness to play again or a player's engagement is a common phenomenon but has attracted little attention or

curiosity amongst researchers (Nichols & Nicki, 2005). It is also considered a non-chemical, excessive human and game interaction, which is behaviourally defined as a player's willingness to play again or a player's engagement (Lu &Wang, 2008) that encompasses encouraging or reinforcing features that encourage continued games for several hours at a stretch (Nichols& Nicki, 2005a)

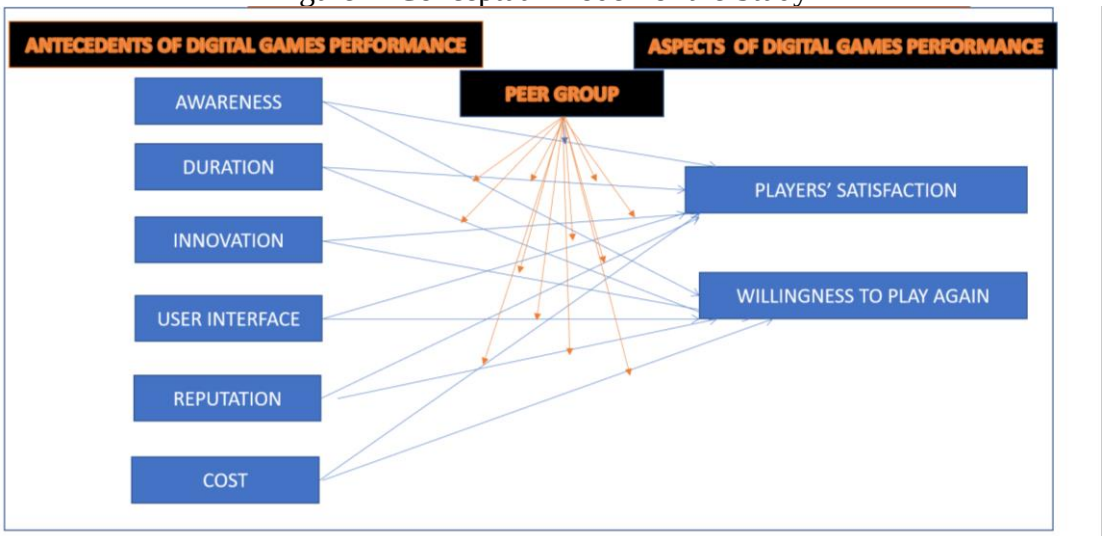
Previous literature on players' willingness to play again indicates that internet use itself may induce an addictive characteristic in gamers (Neumann, 1998). It does not come as a surprise that the internet has substantially impacted consumers' lives.

Given this, Awareness levels, Cost, Duration, Innovation, User Interface (UI) and Reputation tend to have a significant impact on Players' willingness to play again. For instance, an intensive range of personalities play and use online games. Some of them may have higher awareness levels that others, while some of them may have lower awareness levels (Nacke et al., 2010a).

It is also observed that loyal customers are the ones who keep coming back for playing more and more, which thus provides a Competitive Advantage to the firms (Reichheld& Schefter, 2000) and customer (or player) loyalty is essential to the gaming organizations.

Based on the extant literature review, the following model is hypothesized:

Figure 1: Conceptual Model for the Study




Source: Prepared by researchers

## 3. Research Methodology

To achieve the objective of the research study, a conceptual model has been created to hypothesize the relationship between various constructs used in this research.

Digital Games have always been a backbone of our economy. Therefore, in our study, we shed light on the long-term performance aspect of digital games. We took responses from 326 respondents via purposive sampling from all major metropolitan areas of India, namely Delhi, Mumbai, Bangalore, Chennai, Pune and Hyderabad. All the ethical considerations were kept in mind while getting the questionnaires filled in by the respondents. The sample profile of respondents has been depicted in Table No. 1. Consistent with the objectives of the study, the influence of antecedents was analysed on two aspects of digital games performance i.e., players' satisfaction and willingness to play again. The moderation effect of a peer group on the strength and direction of the

relationship between the antecedents and the aspects of digital game performance has been empirically verified.

Table 1: Sample Profile of Respondents (N=326)

| Demographic Factor | Factor Groupings | No. of Respondents | Percentage |
|---|---|---|---|
| Gender | Male | 175 | 53.68% |
| | Female | 151 | 46.32% |
| Education | Graduate | 116 | 35.59% |
| | Post Graduate | 123 | 37.73% |
| | Others | 87 | 26.68% |
| Place | Delhi | 55 | 16.87% |
| | Mumbai | 58 | 17.79% |
| | Bangalore | 56 | 17.18% |
| | Chennai | 53 | 16.26% |
| | Pune | 54 | 16.57% |
| | Hyderabad | 50 | 15.33% |

Source: Prepared by researchers

Table 2: Reliability results for scales used in the study

| | Variables | No of Items | Cronbach Alpha Value |
|---|---|---|---|
| 1. Dependant Variables | Players Satisfaction | 6 | 0.702 |
| | Willingness to play again | 5 | 0.765 |
| 2. Antecedents | Awareness | 7 | 0.731 |
| | Duration | 9 | 0.768 |
| | Innovation | 8 | 0.819 |
| | Reputation | 6 | 0.857 |
| | User Interface | 5 | 0.746 |
| | Cost | 7 | 0.744 |
| 3. Moderator | Peer group | 4 | 0.773 |

Source: Prepared by researchers

Table 2 shows the outcomes of a reliability test performed on the SPSS software used to measure aspects of digital games performance, factors affecting digital game performance and moderators affecting digital game performance.

All the antecedents and the moderator influencing the players' satisfaction and willingness to play again aspects of digital games performance fulfil the reliability condition, which indicates that there is high internal consistency between the variables.

***Regression Analyses of Aspects of Digital Games Performance Related to its Antecedents.***

This section investigates the influence of above-mentioned antecedents on the two aspects of the digital game performance i.e., willingness to play again and players' satisfaction using multiple regression analysis. The aspects of players' behaviour are taken as dependent variables, and the antecedents are taken as independent variables.

### *3.1 Hypotheses Related to Regression Based Analyses of Effect of Antecedents on Player Satisfaction*

$H_{1.1}$ Awareness significantly influences players' satisfaction aspect of digital game performance.

$H_{1.2}$ Duration significantly influences players' satisfaction aspect of digital game performance.

$H_{1.3}$ Innovation significantly influences players' satisfaction aspect of digital game performance.

$H_{1.4}$ User Interface significantly influences players' satisfaction aspect of digital game performance.

$H_{1.5}$ Reputation significantly influences players' satisfaction aspect of digital game performance.

$H_{1.6}$ Cost significantly influences players' satisfaction aspect of digital game performance.

Table 3: Regression Based Analyses of Effect of Antecedents on Player Satisfaction

| **Antecedents →Players' Satisfaction** | **R** | **$R^2$** | **F-value** | **p-value** | **Beta** | **p-value** | **TOL** | **VIF** |
|---|---|---|---|---|---|---|---|---|
| | .246 | .061 | 15.67 | **.000** | | | | |
| **Awareness → Players' Satisfaction** | | | | | .273 | **.001** | .392 | 2.555 |
| **Duration → Players' Satisfaction** | | | | | .058 | **.007** | .763 | 1.318 |
| **Innovation → Players' Satisfaction** | | | | | .293 | **.000** | .774 | 1.270 |
| **User Interface → Players' Satisfaction** | | | | | .068 | **.005** | .725 | 1.381 |
| **Reputation →Players' Satisfaction** | | | | | .075 | .225 | .721 | 1.281 |
| **Cost → Players' Satisfaction** | | | | | -.073 | **.012** | .479 | 2.073 |

*Note: Sig. at p<0.05*

Source: Prepared by researchers

The presence of multi- collinearity is verified by "Variance Inflation Factor (VIF)" and "Tolerance Value" in multiple regression equations. VIF is the reciprocal of TOL, thus high tolerance value means less variance inflation factor. A VIF value of less than 10 and tolerance value of more than 0.1 indicates the absence of collinearity.

The results indicate that there is a significant relationship between players' satisfaction and the factors affecting the digital game performance as the model is significant at $p<.05$ with a value of $R^2$ of .061. If we look at the p value of all the factors, it suggests that all the antecedents contribute significantly to explaining the hypothesized relationship except reputation. Awareness, duration, innovation, user interface, and cost are the important factors, which affect the satisfaction aspect of digital game performance. Awareness of the digital games is seen to have a major impact on players' satisfaction.

We conclude that not only awareness of the digital games boosts players' satisfaction. Setting a cost of the digital games in a more wise way will also have an impact on the satisfaction of the players. Also, players' satisfaction increases when they think that the game is exciting, easy to play and there are fewer restrictions. Innovation

has an essential role in affecting the satisfaction of the players, as most of the players prefer something new in the digital games.

Therefore, the above analyses lend support to these hypotheses i.e., $H_{1.1,}$ $H_{1.2,}$ $H_{1.3,}$ $H_{1.4}$ and $H_{1.6.}$

### *3.2 Hypotheses Related to Regression Based Analyses of Effect of Antecedents on Willingness to Play Again Aspect*

$H_{2.1}$ Awareness significantly influences willingness to play again aspect of digital game performance.

$H_{2.2}$ Duration significantly influences willingness to play again aspect of digital game performance.

$H_{2.3}$ Innovation significantly influences willingness to play again aspect of digital game performance.

$H_{2.4}$ User Interface significantly influences willingness to play again aspect of digital game performance.

$H_{2.5}$ Reputation significantly influences willingness to play again aspect of digital game performance.

$H_{2.6}$ Cost significantly influences willingness to play again aspect of digital game performance.

Table 4: Regression Based Analyses of Effect of Antecedents on Willingness to Play Again Aspect

| **Antecedents » Willingness to Play Again** | **R** | **$R^2$** | **F-value** | **p- value** | **Beta** | **p- value** | **TOL** | **VIF** |
|---|---|---|---|---|---|---|---|---|
| | 0.256 | 0.065 | 16.67 | **0** | | | | |
| Awareness Willingness to Play Again | | | | | 0.283 | **0.003** | 0.392 | 2.555 |
| Duration Willingness to Play Again | | | | | 0.047 | **0.005** | 0.763 | 1.318 |
| Innovation Willingness to Play Again | | | | | 0.393 | **0.002** | 0.774 | 1.27 |
| User Interface Willingness to Play Again | | | | | 0.057 | **0.003** | 0.725 | 1.381 |
| Reputation Willingness to Play Again | | | | | 0.062 | 0.232 | 0.721 | 1.281 |
| Cost Willingness to Play Again | | | | | -0.083 | **0.011** | 0.479 | 2.073 |

*Note: Sig. at p<0.05*

Source: Prepared by researchers

The above table indicates that there is a significant relationship between the antecedents of digital game performance and players' willingness to play again. The aspect of digital game performance and the regression model is significant at $p < .05$ and the value of $R^2$ is .065.

If we examine the significance of each antecedent influencing willingness to play again, innovation, awareness and user interface are the significant antecedents with beta values of .393, .283 and .057 respectively.

It is found out from our study that a cost of the digital games also attracts the players and increases their willingness to play a specific digital game again. Therefore, the cost of the digital games should not be too high or too low. The games should be user-friendly, and it should be convenient for them to play. The duration of the game should also be moderate, as a long duration of the game dose not attract players' attention and becomes boring for the players. The players' willingness to play again does not only

depend upon the above-mentioned antecedents, but it is also found that the innovative factor also makes them want to re-play. Hence, companies need to create innovative games which really gives players' an excitement to play and willing to replay them multiple times.

The results lend support to these hypotheses i.e., $H_{2.1}$, $H_{2.2}$, $H_{2.3}$, $H_{2.4}$, $H_{2.6}$**.**

## 4. Hierarchical Regression Analyses of Aspects of Digital Games Performance related to its Antecedents

This section investigates the influence of the peer group on the relationship between each antecedent on the two aspects of the digital game performance i. e. , willingness to play again and players' satisfaction, using hierarchical regression analysis. The aspects of players' behaviour are taken as dependent variable, and the antecedents are taken as independent variables, and the peer group is taken as moderator variable.

### *4.1 Moderation effect of peer group on the relationship between antecedents and the players' satisfaction*

With the aim of analysing the influence of the peer group on the strength and direction of the relationship between antecedents and the players' satisfaction aspect of digital games performance. The relationship between variables was empirically tested for each antecedent separately by using hierarchical regression technique. The assumption of multicollinearity has been checked by using VIF and TOL diagnostic factors. The results indicate that values of TOL are greater than 0.1 and values of VIF are less than 10 in all regression equations.

The impact of the peer group on the strength and direction of the relationship between the antecedents and the players' satisfaction is reported in Table 3.

#### *4.1.1 Hypotheses Related to Hierarchical Regression Based Analyses of Peer Group Effect on the Relationship between Antecedents and Players' Satisfaction*

$H_{3.1}$ Peer groups moderate the influence of awareness on the players' satisfaction aspect of digital game performance**.**

$H_{3.2}$ Peer groups moderate the influence of duration on the players' satisfaction aspect of digital game performance**.**

$H_{3.3}$ Peer groups moderate the influence of innovation on the players' satisfaction aspect of digital game performance**.**

$H_{3.4}$ Peer groups moderate the influence of user interface on the players' satisfaction aspect of digital game performance**.**

$H_{3.5}$ Peer groups moderate the influence of reputation on the players' satisfaction aspect of digital game performance**.**

$H_{3.6}$ Peer groups moderate the influence of cost on the players' satisfaction aspect of digital game performance**.**

Table 5: Hierarchical Regression Based Analyses of Peer Group Effect Between Antecedents and Players' Satisfaction

| | $R^2$ | | Antecedents Effect | | Peer Group EFFECT | | INTERACT. EFFECT IV*MV | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Before** | **After** | **$\beta_1$** | **P value** | **$\beta_2$** | **P value** | **$\beta_3$** | **P value** | **VIF** | **TOL** |
| **Awareness** | .021 | .061 | .273 | .003 | .193 | .037 | .283 | **.000** | 1.013 | .987 |
| **Duration** | .005 | .011 | .058 | .020 | .093 | .047 | .096 | **.032** | 1.013 | .987 |
| **Innovation** | .012 | .031 | .293 | .028 | .110 | .027 | .336 | **.004** | 1.013 | .987 |
| **User Interface** | .013 | .024 | .068 | .240 | .087 | .050 | .075 | **.050** | 1.013 | .987 |
| **Reputation** | .008 | .026 | .075 | .270 | .140 | .005 | .081 | **.007** | 1.013 | .987 |
| **Cost** | .020 | .025 | -.073 | .006 | .031 | .020 | -.083 | **.001** | 1.013 | .987 |

*Note: Sig. at p<0.05*
Source: Prepared by researchers

The results show in Table 5 indicate that all the antecedents except reputation i.e., awareness, duration, innovation, user interface, and cost, have a significant impact on the players' satisfaction aspect of the digital game performance at p<.05.

The interaction effect has a significant impact on the strength of the relationship between the antecedents and the players' satisfaction aspect of digital game performance as beta values of awareness, duration, innovation, user interface and cost have increased from .273, .058, .293,.068 and -.073 to .283, .096, .336, .075 and -.083 respectively.

Concerning the reputation antecedent, it has an insignificant impact on the players' satisfaction aspect, but after interaction with their peer group, reputation has also become a significant factor impacting players' satisfaction aspect of digital game performance.

Therefore, the results are in support of the hypotheses $H_{3.1}$, $H_{3.2}$, $H_{3.3}$, $H_{3.4}$, $H_{3.5}$ and $H_{3.6}$.

### *4.2 Moderation effect of peer group on the relationship between antecedents and the willingness to play again*

With the objective of examining the effect of the peer groups on the relationship between the factors and the willingness to play again aspect of digital game performance, the relationship between variables was tested empirically by using the hierarchical regression technique. The assumption of multicollinearity has been checked by using VIF and TOL diagnostic factors. The results indicate that values of TOL are greater than 0.1 and values of VIF are less than 10 in all regression equations.

The effect of the peer groups on the strength and direction of relationship between the factors and the willingness to play again is reported in Table 6.

#### *4.2.1 Hypotheses Related to Hierarchical Regression Based Analyses of Peer Group Effect on the Relationship between Antecedents and Willingness to Play Again*

$H_{4.1}$ Peer groups moderate the influence of awareness on the willingness to play again aspect of digital game performance**.**

$H_{4.2}$ Peer groups moderate the influence of duration on the willingness to play again aspect of digital game performance**.**

$H_{4.3}$ Peer groups moderate the influence of innovation on the willingness to play again aspect of digital game performance**.**

$H_{4.4}$ Peer groups moderate the influence of user interface on the willingness to play again aspect of digital game performance**.**

$H_{4.5}$ Peer groups moderate the influence of reputation on the willingness to play again aspect of digital game performance**.**

$H_{4.6}$ Peer groups moderate the influence of cost on the willingness to play again aspect of digital game performance**.**

Table 6: Hierarchical Regression Based Analyses of Peer Group Effect Between Antecedents and Willingness to Play Again

| | $R^2$ | | Antecedents Effect | | Peer Group EFFECT | | INTERACT. EFFECT IV*MV | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Before** | **After** | **$\beta_1$** | **P value** | **$\beta_2$** | **P value** | **$\beta_3$** | **P value** | **VIF** | **TOL** |
| **Awareness** | .021 | .061 | .283 | .003 | .193 | .027 | .287 | **.001** | 1.050 | .952 |
| **Duration** | .005 | .011 | .047 | .005 | .093 | .037 | .087 | **.022** | 1.050 | .952 |
| **Innovation** | .012 | .031 | .393 | .002 | .110 | .045 | .412 | **.014** | 1.050 | .952 |
| **User Interface** | .013 | .024 | .057 | .003 | .087 | .040 | .065 | **.030** | 1.050 | .952 |
| **Reputation** | .008 | .026 | .062 | .232 | .140 | .001 | .071 | **.027** | 1.050 | .952 |
| **Cost** | .020 | .025 | -.083 | .011 | .031 | .030 | -.085 | **.011** | 1.050 | .952 |

*Note: Sig. at p<0.05*

Source: Prepared by researchers

On the basis of the above hierarchical regression analysis, it is found that all antecedents, i. e. , awareness, duration, innovation, user interface, and cost except reputation, have significant impact on the willingness to play again aspect of digital game performance. The relationship between these antecedents and the willingness to play again aspect of digital game performance medicine is found to be significant at p<.05.

The interaction of peer groups on the relationship between antecedents and the willingness to pay again is significant. The interaction effect has increased the strength of the relationship between the antecedents and the willingness to play aspect of digital game performance. As we see from Table 6, in all antecedents, i. e. , awareness, duration, innovation, user interface, and cost, the beta values have increased from .283, .047, .393, .057, .250, -.083, to .287, .087, .412, .065, and .085 respectively.

In the case of the reputation antecedent, it has an insignificant impact on the willingness to play again aspect, but after interaction with peer groups, reputation has also become an important antecedent impacting the willingness to play again aspect of digital game performance.

Therefore, it lends support to the hypotheses $H_{4.1}$, $H_{4.2}$, $H_{4.3}$, $H_{4.4}$, $H_{4.5}$ and $H_{4.6}$

## 5. Conclusion, Limitation and Future Research Directions

In recent years, the digital game industry in India has contributed significantly towards the Indian economy. Whether it is mass employment in the digital game sector or the production of gaming paraphernalia such as gaming consoles, today's digital era has attracted a large portion of the population to this sector. The investment in R&D in the digital game industry will also benefit other industries, as this industry contributes to the sale of the products of other industries. This research has the objective of exploring the various factors that contribute to the success of digital game developing organizations and being able to gauge the relationships and interdependencies between game performance and those factors that have an essential role to play in the success of the business. This is a pioneer in this field of study in a sense that the study explores

antecedents that contribute to game interest and the performance of digital game production that eventually helps organizations generates profits.

The results were very much in sync with the antecedents, exhibiting that whenever players were deeply immersed in the game, they would often forget the limitations of time. Similarly, the players discovered those games and appreciated the specific living environments relating to the history of stories that evoked relatedness and motivation pertaining to their own living styles.

The game itself and the player design the gaming experiences in a feedback loop entailing "cognitive, emotional, and kinaesthetic" elements. It stated that players' moods and emotional states can significantly affect the probability that the respondent would take the game and indulge in it for a longer period of time (Calleja, 2007). Digital games have the potential to be transformed into sought-after and highly engaging tools for learning as well as training. The prerequisite is that game developers must be capable of creating situational, spatial, and mechanical simulations in combination with the latest and updated technology.

The popular theory describing the process of flow has also endeavoured to provide certain important insights that developers can incorporate into their designing techniques. These can be the provision of immediate feedback, designing challenges to enhance player skill, and developing interest by introducing novel gaming goals (Carr *et al*., 2006a; King & Krzywinska, 2006a). During an exciting activity, there is an energetic activation that is the result of the thought-action repertoire. This is associated with the transcendence of positive emotions that happen during gaming (Quinn *et al.*, 2012; Schippers & Hogenes, 2011; Fredrickson, 2001).

This study has perused existing literature and fostered the idea that games are not purely meant for entertainment but have the premise in the fulfilment that explores their antecedents through the lens of willingness to play again and increased duration. The following noteworthy implications have been derived from our findings.

We have applied regression analyses to find out the effect of antecedent variables on the players' satisfaction and the willingness to play again aspects of digital game performance. It is concluded from the regression analysis that awareness, duration, user interface, innovation, and cost, are the major antecedents that satisfy the players, and attract them to play again.

Game Awareness refers to the strength of a game's presence in the players' mind. It is found that awareness has a significant impact on digital game performance. The mean scores are high in the case of awareness. Gamers, who are more aware, are more keen to enjoy new games (Xin,2008). Therefore, digital game companies should create more awareness of their games using more innovative techniques, such as naming the game, promotion by celebrity, etc.

The results have indicated that the duration the players indulge in and gain more knowledge about the upcoming features, spend more time on exploration and enjoyment. The duration of the game should be neither too short nor too long. An explanation for this is that too short a game does not allow players to indulge and hence learn from it, whereas a longer duration makes the game less exciting and monotonous (Lee *et al.*, 2006). Companies should give enough information about new features, followed by showing the feedback of the existing players. Another possible implication could be focusing on adequate duration programs according to the demographic profile of the players' segment.

Innovation in the digital game industry involves the use of novel ideas and the use of creativity with the objective of influencing more players and thus increasing the performance of the digital game business. Several studies have pointed out the issue of

innovation in this industry (Christensen, 1997). Therefore, game development companies should consider innovation as a fundamental source of competitiveness as these innovations will also contribute to improving the competitiveness of the Indian economy.

User Interface is also the major factor which affects the performance of the digital games (Katsaliaki & Mustafee, 2012). Therefore, companies should offer convenience according to the players' expectations. Game Development companies should consider various aspects of players' such as age, income level, education profile of players while designing techniques of playing the games.

All the antecedents except 'reputation' had a significant impact. Reputation reportedly did not have significant influence related to the players' satisfaction and willingness to play again aspect of digital game performance. Therefore, companies should focus more on other antecedents, while designing their promotional strategies for their digital games.

The cost factor had a significant impact on the players' satisfaction and the willingness to play again. However, our study has shown negative impact of the cost on the digital game performance i.e., the costlier the game is, the less excitement it generates from the players. It has also been supported by previous research (Jörg *et al.*, 2012; Afuah, 2009a; Johannessen, 2013). Therefore, digital game companies should design their strategies of games by focusing on these three factors i.e., moderate price range, moderate duration, and user interface if they really want to attract the willingness of the players to play again.

Peer groups are the major influencers as they affect the large number of players' behaviour to play the games again and also boost their confidence, which leads to more satisfaction (Shih *et al*., 2015). In case of willingness to play and the players' satisfaction aspect, the effect of reputation has turned from insignificant to significant due to the interaction effect of the peer group. On the basis of empirical tests, peer groups moderate the relationship between the antecedents of digital game performance and the aspects, i.e., players' satisfaction and the willingness to play again of digital game performance. Therefore, game companies should identify these peer groups and the factors which affect their game choices as these peer groups affect many players' behaviour.

Hence, the managers of the games industry must exploit and utilize this concept well so as to promote their respective cities for the success of the digital game performance of their companies and to add value to society and the Indian economy. We can conclude that digital games will be enjoyable as long as they seem relevant, provide an intriguing pleasurable experience, and have the sheer willingness to indulge again. Also, findings suggest that players use digital games for entertainment. This work suggests that digital games that are not boring and, contrarily, feel more engaging as per the underlying factors, positively influence perceptions of gamers and intrigue fun and excitement. Hence, the findings of this research could be applied to numerous real-world environments that play an important role in promoting engagement amongst game players (Alkhattabi *et al*., 2011).

The major limitations of this study were time constraint and access to information constraint especially with regard to the digital games sector. The personal bias of respondents might have had an impact on the data, though every check was made to ensure that they were unbiased. Also, the list of factors affecting players' behaviour is not exhaustive, i.e., there are certain other variables that can be examined in future studies to gain an in-depth knowledge of players' behaviour. Additionally, the study is restricted in comprehensiveness of its findings. Though the study has extensive coverage, the results cannot be generalized. It will be worthwhile if studies are conducted in the future using larger sample size**.**

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