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STUDENT'S ADOPTION INTENTION FOR ONLINE GAMING USING TAM MODEL

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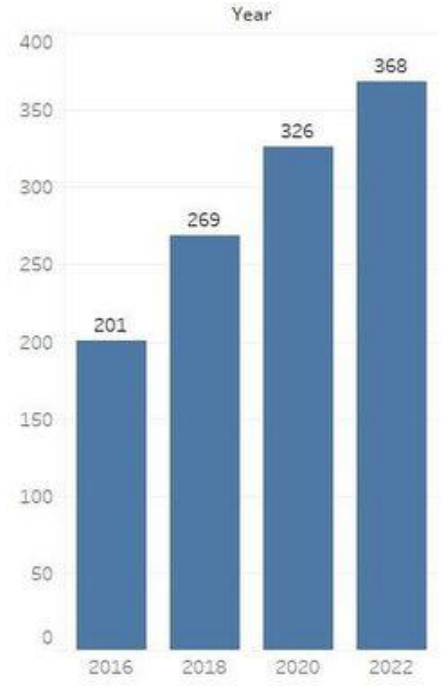
Abstract: This study has been undertaken to investigate the determinants of student's adoption intention for online gaming using TAM model.To test the variables a likert scale google form questionnaire was collected from 259 students of reputed universities and colleges of India. The finding were found that variables like attitude,subjective norms and perceived usefulness are the most influencial indicators for adopting online games among students.

India's online gaming sector was valued at USD2.6 billion in 2022 with over 50.7crore gamers, of which almost one fourth are paying users. The online gaming industry is projected to reach USD 8.6 billion in 2027. The online gaming industry is expected to grow at 27%CAGR by 2027. The government of India will also introduce a new section which will provide structured growth to this burgeoning industry (Online gaming, 2023). Online gaming was already one of the top five mobile device activities in 2019. During the Covid pandemic the interest towards the online gaming has increased as other recreational options are not available. Live concerts and movie theatres were closed. The OTT platform had the content but due to covid restrictions there was no shooting and the viewers are not interested as they have watched the old episodes. Online gaming was there which lot of people has not tried and it has an edge over other entertainment options. Consumer engagement which is measured by the time spent on online gaming was surged by 21% during the national lockdown. Today India has become one of the top 5 mobile gaming markets in the world. More than half of the population of India is below 35 years and the median age of India is 29 which is better than Japan and China. The people from rural areas and women are also interested in online gaming. The number of online gamers has increased in India to 368 million as mentioned in figure 1.

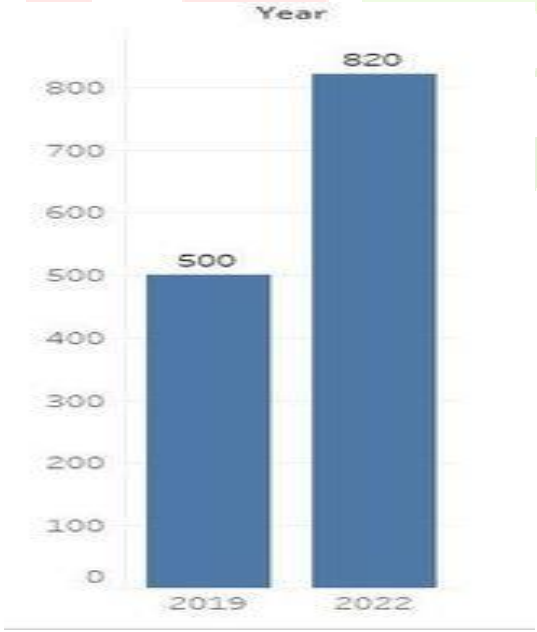
Figure 1: No. of Online gamers in India (in Million)



Source: The Power of Mobile Gaming in India, MMA and Kantar IMRB in association POKKT

The number of smartphone users is also increasing in India and it will reach 820 million in 2022 as mentioned in Figure 2. Companies are also increasing the features in smart phones. The widespread acceptance of digital payment options has substantially reduced friction and provided a vehicle for video game monetization. Subscription-based models are becoming more common, with gamers paying a monthly fee in exchange for ad-free content and upgrades (Deloitte, 2021).

Figure 2: Smart Phone users in India (in million)



Source: India Cellular and Electronics Association (ICEA) report

The Information Technology Ministry recently recommended regulating online gaming and intends to formalize a structure. The government has announced the establishment of 100 new labs in India for the development of 5G applications. The government has also announced to lower the custom duty on the import of mobile parts which will further give boost to this sector (Aggarwal, 2023).

Review Of Literature

1. Lin et al. (2013) conducted a study to examine the behaviors that impact the uptake of online games. The research involved 466 participants, mainly students from universities and colleges. The findings showed that players' favorable attitudes towards the game were linked to their intention to play. Additionally, the belief that they could receive recognition, satisfaction, happiness, and pleasure from the game was a driving factor for playing.
2. In Lee, M. C. (2009), the aim of the research was to examine the impact of flow experience, perceived enjoyment, and interaction on people's intention to play online games. The data was collected from 458 respondents through an empirical study using action-theoretical methodologies (TAM and TPB). The results showed that the TPB model was better suited than the TAM model, and that flow experience was found to be a crucial factor in driving people to play online games. However, female respondents were found to be less likely to be influenced by perceived enjoyment.
3. Merhi (2016) in their research paper focuses on the Uses and Gratifications (U&G) theory. They proposed and tested an integrated model that explored the factors that influence the behavior of 308 American university students towards the adoption of online games. The findings showed that the intention to play was influenced by perceived enjoyment, social interaction, and achievement.
4. Dahabiyeh et al. (2021) conducted a study to explore the drivers behind individuals playing online games despite the presence of cybersecurity risks, such as physical and psychological hazards associated with these games. The research collected 301 responses using Amazon Mechanical Turk and found that despite the risk, players' curiosity was a significant factor that motivated them to play.
5. Ha et al. (2007) conducted a study aimed at identifying the factors that influence the adoption of mobile games and providing game developers with strategies for increasing market acceptance. The authors applied the Technology Acceptance Model (TAM) to analyze the drivers behind online gaming behavior. The results showed that players' perceptions of enjoyment did not change as a result of their continuous play of online games.
6. Liu (2016) conducted a study to analyze gender disparities in attitudes and acceptance towards online games. The research involved collecting 216 responses to evaluate the factors that influence player behavior towards online games. The study found that both internal (self-efficacy) and external (social influence) elements had an impact on online gaming.
7. Rauschnabel et al. (2017) conducted a study to examine the motivation and purpose of playing online games, specifically focusing on in-app purchases. The study used the concept of Uses and Gratifications Theory (U&GT) to provide a framework. It included 642 Pokémon Go gamers as participants. The findings revealed that the unique gaming experience was driven by happiness and enjoyment, emotional and social factors, and social norms, which attracted gamers to play online games.
8. Ramírez-Correa et al. (2019) aimed to analyze the acceptance of online games using the Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2). The data was collected from 152 online players in Spain who were playing a mobile game. The analysis found that UTAUT 2 accounted for 71% of mobile game play, and the study emphasized the importance of motivation in playing online games.
9. Lee and Tsai (2010) proposed a research model to understand the factors behind playing computer games and how society influences and encourages such behavior. The model combined the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB) to explain why people persist in playing online games. The study included 415 participants and found that player attitudes vary and each player has unique motivations for playing, contributing to their continued interest in online games.
10. In their research, Wu and Liu (2007) proposed a theoretical model that adds two new constructs, trust and enjoyment, to the theory of reasoned action (TRA). The study was conducted to understand the impact of attitude towards playing online games, online gaming enjoyment, and subjective norms on online gaming intention. The findings revealed that

enjoyment was the most significant factor influencing online gaming intention and that both trust in online gaming websites and enjoyment had a significant impact on the intention to play online games.

11. In the study by Wu, J. H., et al. (2010), the authors used the Uses and Gratifications theory to investigate why players enjoy online games. They collected data from online game players to uncover the factors that motivate them to play. The results showed that different players have different motivations for playing online games, such as achievement, enjoyment, and social interaction, and that these motivations have varying impacts on their overall satisfaction with the games. The study highlights the importance of understanding player needs and expectations in the online gaming community.
12. In the research paper by Park, et.al., (2011), the authors aimed to examine the motivations for playing online games and how personality affects these motivations and behavior. The study was conducted by distributing 524 questionnaires among 9 co-ed universities, and the results were analyzed using factor analysis and regression analysis. The results showed that agreeableness and extraversion were identified as key predictors for motivation in playing online games, however, personality traits were not found to predict any online gaming behavior.
13. In their research paper, Gao (2005) conducted a theoretical study to explore the factors that influence the trust of users in online games. The study considered the perspectives of online gamers as computer users and consumers of web-based entertainment, and analyzed both the aspects of the games and the online environment. The results showed that trust was influenced by six factors ranging from the macro perspective of the user's perception of the gaming company to the micro perspective of the user's perception of a specific game.
14. The research paper by Beltagui, A., et.al., (2019) aimed to explore the factors that influence the willingness to pay (WtP) among players of freemium-based online games. The study was conducted by surveying players to gather data on their social orientation, achievement orientation, and sense of community. The results showed that a strong sense of community combined with a shared sense of achievement was the key factor in a player's willingness to pay for the online game.
15. Saddhono, K., et al., (2020) conducted a study to explain the Certainty Factor Method for diagnosing online game addiction in adolescents. The study collected data from 200 students from Indonesia and the Java islands who played various online games such as Ragnarok and Seal, League of Legends, DOTA2, Warcraft, Counter Strike, and Point Blank. The results showed that the level of addiction among the players in Indonesia and Java was medium level, and the researchers believed that players would stop playing games if it affected their academic activities.

Objective:

1. **To study the antecedents of online game adoption among individuals.**

Research Methodology

The data was be collected from the students of some of the top colleges and universities of India.. The age of the respondents is from 15-30 years. Convenience sampling will be used to fill the survey. A five point likert scale will be utilized and respondents Reaspondents will be intstructed to check their agreement with each item, ranging from (1) to (5) from strongly agree to strongly disagree. The scale items used in this study were chosen from previously validated assessments. SPSS software was used to process the dataset.

Hypothesis framed :-

H1- There is no impact of attitude on the adoption intention.

H2- There is no imapct of subjective norms on the adoption intention.

H3- There is no impact of perceived usefulness on the adoption intention.

H4- There is no use of perceived ease of use on the adoption intention.

H5- There is no impact of trust on the adoption intention.

H6- There is no impact of visual appearance on the adoption intention.

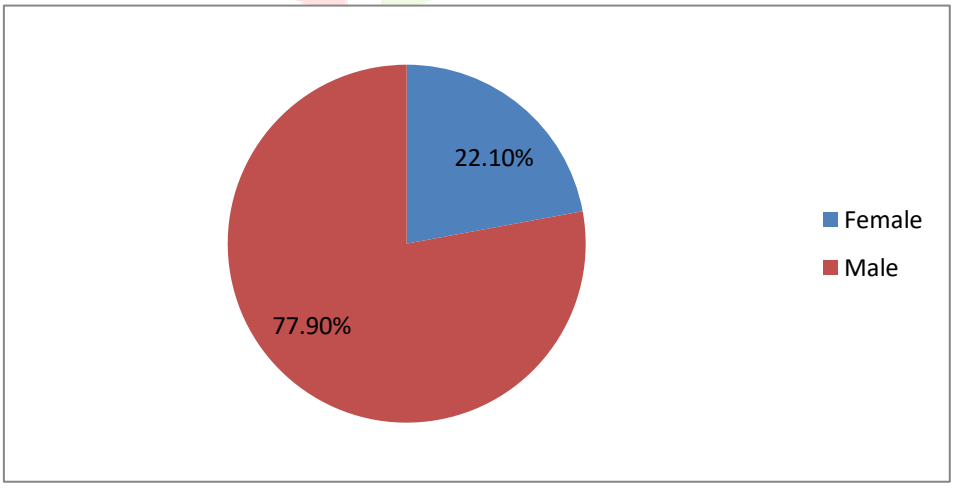
Analysis and Interpretation

Based on the information, there are 257 respondents, out of which 60 respondents do not play online games and do not intend to play in the future. 197 respondents play online games and have the intention to continue playing in the future. 7 respondents have not filled the data, leaving 190 respondents selected for the study.

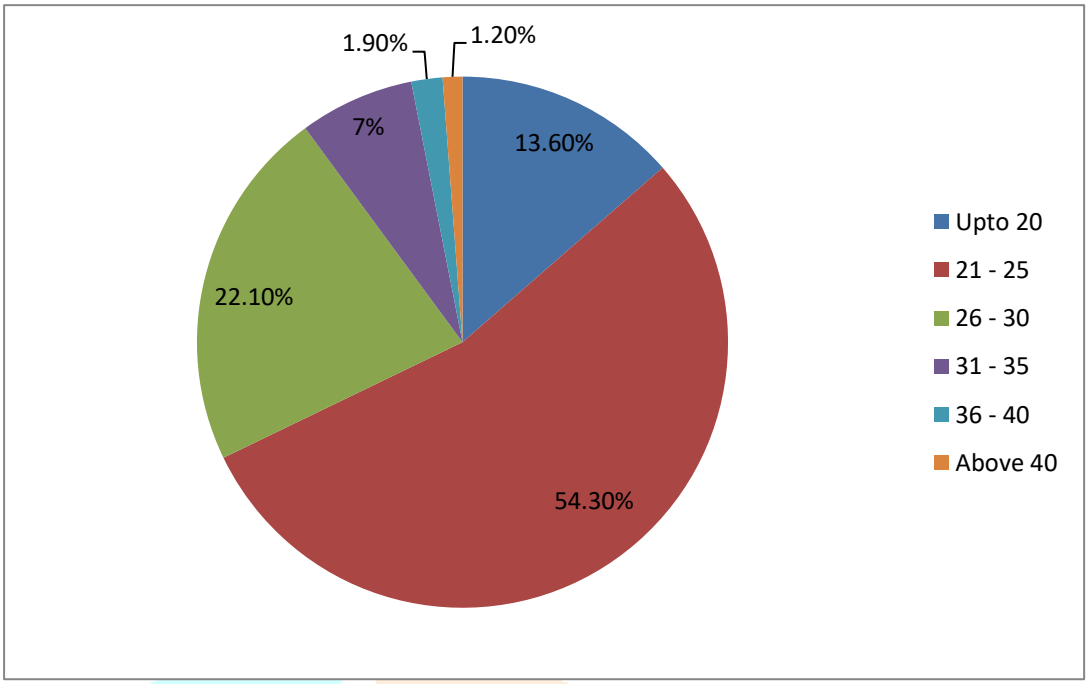
The data collected from 190 respondents was processed and entered into SPSS software for analysis. The variables analyzed in this study were "Perceived Ease of Use", "Perceived Usefulness", "Trust", "Attitude", "Subjective Norms", "Visual Appearance", and "Intention", with "Intention" being the dependent variable and the rest being the independent variables. The aim of the study was to examine the impact of the independent variables on the dependent variable. The regression test was performed on the data collected only from students across various colleges and universities in India, comprising of both male and female genders who answered "yes" to the question "Do you play online games?" in the first section of the google form questionnaire. The questionnaire consisted of 31 questions in total, divided into three sections.

Data analysis

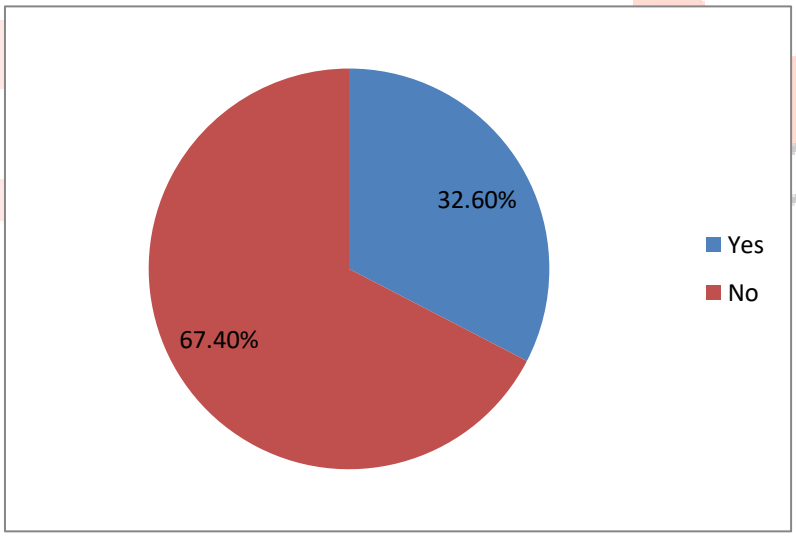
1. Gender-wise responses – The dataset is comprised of 58 females and 201 of male responses .



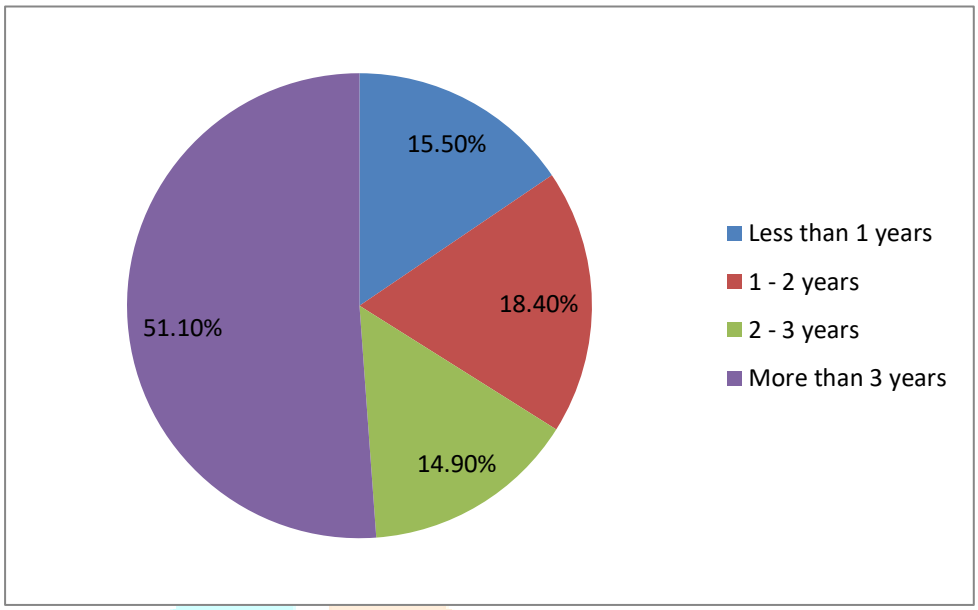
2.Age-wise distribution of respondents – The respondents are comprised of 140 individuals between 21-25 age category, 57 individuals in 26-30 age category, 18 individuals in 31-35 age category , 35 individuals in upto 20 age category, 6 individuals are in 36-40 age category and only 3 individual from above 40 age category.



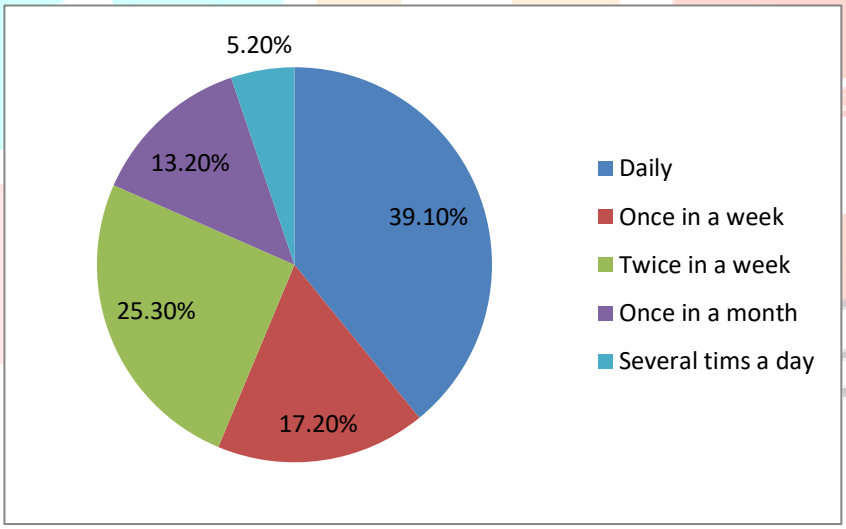
3. Thi pie-chart shows about the percentage of respondents who play online games/not – 173 individuals had responded to playing online games while 86 doesn't.



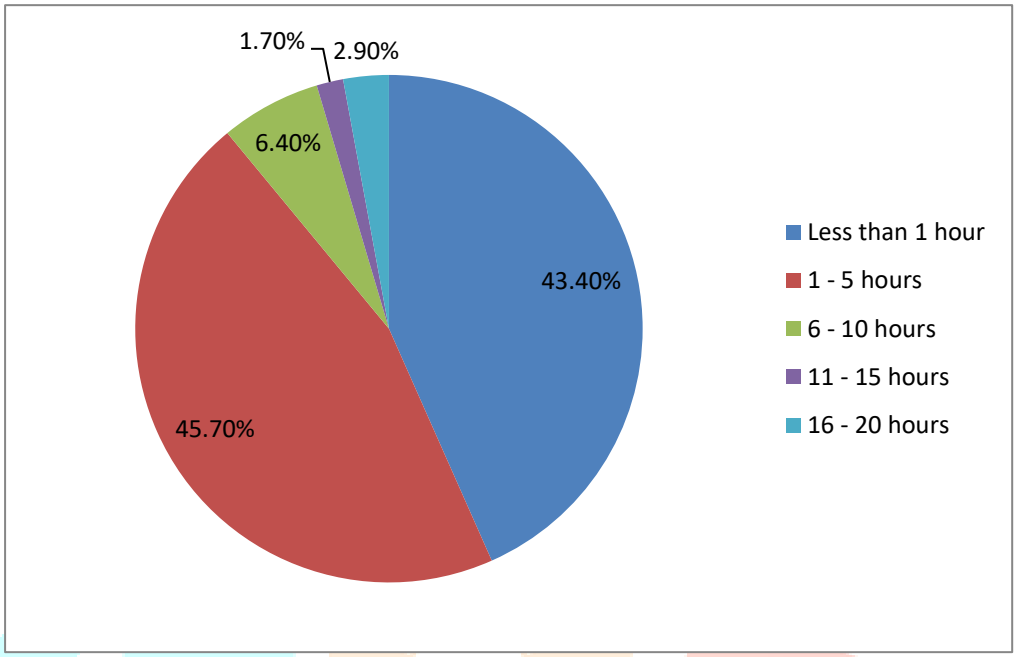
4. This pie-chart shows about respondents playing online games from how many years – 89 individuals had given response in playing online games for more than 3 years, 32 individuals had given response of playing online games for 1-2 years, 27 individuals had given response of playing for less than 1 years and 26 individuals had a response of playing online games for 2-3 years.



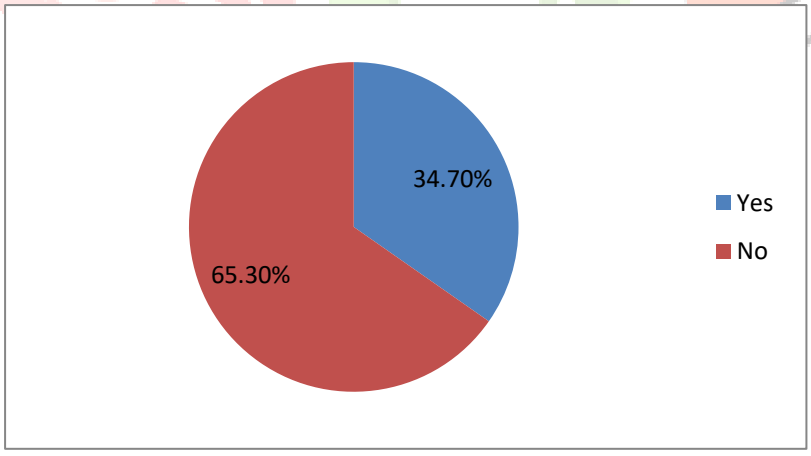
5. This pie-chart shows about the playing time duration of the respondents -



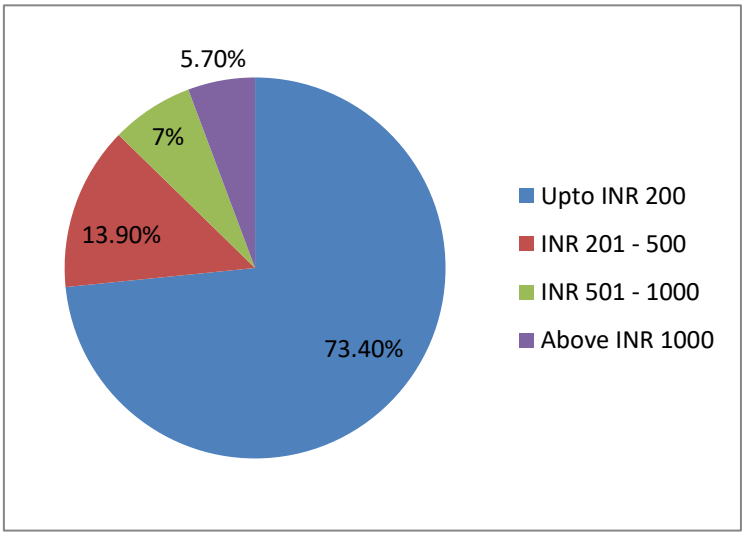
6. This pie-chart shows about the time period duration of our respondents playing in a week – 79 individuals said that they play 1-5 hours per week, 75 of remaining said they play less than 1 hour per week, 11 individuals said that they play online games in between 6-10 hours per week, 5 responded had habit of playing for 16-20 hours per week and 3 individuals play for 1115 hours per week.



7. This pie chart shows about the percentage of repondents who will continue playing online games if subscription price is charged – 113 respondents said that they don't wish to play online games if it charged some subscription amount(in-app purchases) with 60 individuals said that they will play by paying the charges.



8. This pie-chart shows about the amount of subscription charges (in app purchases) which the respondents are comfortable to pay – 116 indviduals are comfortable in paying upto INR200 for playing online games,13 individuals are comfortable in paying INR 201-500 for it, 11 individuals are comfortable in paying INR 501-1000 and 9 individuals are comfortable in aying above INR 1000 for playing online games.



There are four primary tables in the SPSS:

Model Summary: This table provides information about the overall fit of the regression model, including R-square, adjusted R-square, and the F-value.

ANOVA: This table tests the significance of the overall regression model by comparing the explained variance in the dependent variable (intention) to the residual variance.

Coefficients: This table provides the estimated coefficients for each independent variable, including the constant (intercept), beta values, t-values, and p-values.

Residuals: This table provides information about the residuals, including the residual mean and standard deviation, which can be used to assess the normality of the residuals and the presence of outliers.

Results -

Model Summary - Model Summary table produced by the multiple linear regression test in SPSS. It elaborates the model's characteristics.

Model Summary[e]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.774[a]	.599	.586	.60016	
2	.774[b]	.599	.588	.59896	
3	.773[c]	.598	.589	.59816	
4	.772[d]	.595	.589	.59845	2.076

a. Predictors: (Constant), Visualappearance, Trust, Easeofuse, Usefulness, SubjectiveNorms, Attitude

b. Predictors: (Constant), Trust, Easeofuse, Usefulness, SubjectiveNorms, Attitude

c. Predictors: (Constant), Trust, Usefulness, SubjectiveNorms, Attitude

d. Predictors: (Constant), Usefulness, SubjectiveNorms, Attitude

e. Dependent Variable: Intention

Elements interpretation of the results:

Stepwise regression –

Step 1 – The first variable entered in the model is Visual appearane with the significant *p* value 0.607(when α = 0.05) doesn't conttibutes significantly in the regression model for which it is eliminated.

Step 2 – In the second step , the second explanatory variable Trust with the significant *p* value 0.279(when α = 0.05) doesn't contributes significantly in the regression model for which it is eliminated.

Step 3 – In the third step, the third explanatory variable ease of use with the significant *p* value 0.477(when α = 0.05) doesn't contributes significantly in the regression model for which it is eliminated.

ANOVA Table – The third table determines whether the model is substantial much to forecast the outcome.

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	98.665	6	16.444	45.655	.000[b]
	Residual	65.914	183	.360		
	Total	164.580	189			
2	Regression	98.570	5	19.714	54.952	.000[c]
	Residual	66.010	184	.359		
	Total	164.580	189			
3	Regression	98.388	4	24.597	68.746	.000[d]
	Residual	66.192	185	.358		
	Total	164.580	189			
4	Regression	97.966	3	32.655	91.180	.000[e]
	Residual	66.614	186	.358		
	Total	164.580	189			

a. Dependent Variable: Intention

b. Predictors: (Constant), Visualappearance, Trust, Easeofuse, Usefulness, SubjectiveNorms, Attitude

c. Predictors: (Constant), Trust, Easeofuse, Usefulness, SubjectiveNorms, Attitude

d. Predictors: (Constant), Trust, Usefulness, SubjectiveNorms, Attitude

e. Predictors: (Constant), Usefulness, SubjectiveNorms, Attitude

The table elements are relevant for reporting the data:

- P-value/Sig value: For most studies, the 95% confidence interval or 5% threshold of significance is used. Thus, the p-value should be less than 0.05. It is.000 in the table above. As a result, the outcome is substantial.

- F-ratio: It represents an improvement in variable prediction by fitting the model after taking into account the model's inaccuracy. For the F-ratio yield efficient model, a value greater than one is used. The value in the table varies between 45.655 to 91.180, which is satisfactory.

Coefficient Table - The table below illustrates the strength of the relationship, i.e. the relevance of the variable in the model and the magnitude with which it influences the dependent variable. This analysis aids in hypothesis testing for a study.

In interpretation, only one value is significant: the significant value . The result should be less than the study's tolerated threshold of significance, which is less than 0.05 for the 95% confidence interval in this study. The null hypothesis is rejected or not rejected based on the significance value.

If Sig. is less than 0.05, the null hypothesis is rejected. If Sig. > 0.05, the null hypothesis is not rejected. If a null hypothesis is rejected, it indicates that there is an impact. However, if a null hypothesis is not rejected, it suggests there is no influence.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.177	.234		.756	.451
	Easeofuse	-.045	.059	-.042	-.760	.448
	Usefulness	.176	.058	.181	3.051	.003
	Trust	.072	.061	.070	1.170	.243
	Attitude	.247	.073	.241	3.398	.001
	SubjectiveNorms	.439	.065	.445	6.744	.000
	Visualappearance	.037	.072	.033	.515	.607
2	(Constant)	.219	.218		1.005	.316
	Easeofuse	-.042	.059	-.039	-.712	.477
	Usefulness	.179	.057	.184	3.125	.002
	Trust	.070	.061	.069	1.149	.252
	Attitude	.266	.063	.259	4.244	.000
	SubjectiveNorms	.443	.065	.448	6.848	.000
3	(Constant)	.167	.205		.813	.417
	Usefulness	.164	.053	.168	3.085	.002
	Trust	.066	.061	.065	1.086	.279
	Attitude	.260	.062	.254	4.194	.000
	SubjectiveNorms	.442	.065	.448	6.849	.000
4	(Constant)	.216	.200		1.080	.282
	Usefulness	.174	.052	.178	3.318	.001
	Attitude	.270	.061	.264	4.400	.000
	SubjectiveNorms	.470	.059	.476	7.906	.000

a. Dependent Variable: Intention

As a result, the data reveals that the Perceived usefulness, Attitude, Subjective Norms are directly influencing players to adopt an online game.

Excluded Variables[a]

Model		Beta In	T	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
2	Visualappearance	.033[b]	.515	.607	.038	.525
3	Visualappearance	.028[c]	.439	.661	.032	.530
	Easeofuse	-.039[c]	-.712	.477	-.052	.710
4	Visualappearance	.025[d]	.396	.693	.029	.531
	Easeofuse	-.033[d]	-.604	.547	-.044	.717
	Trust	.065[d]	1.086	.279	.080	.610

a. Dependent Variable: Intention

b. Predictors in the Model: (Constant), Trust, Easeofuse, Usefulness, SubjectiveNorms, Attitude

c. Predictors in the Model: (Constant), Trust, Usefulness, SubjectiveNorms, Attitude

d. Predictors in the Model: (Constant), Usefulness, SubjectiveNorms, Attitude

The hypothesis tests if attitude doesn't have any impact on the adoption intention. The dependent variable adoption intention was regressed on predicting variable attitude to test the hypothesis H1, adoption intention significantly predicted attitude, $F(1, 189) = 91.180$, $p < 0.001$, which indicates that the attitude can play a significant role in shaping adoption intention ($b = 0.270$, $p < 0.001$). These results clearly direct the positive effect of the attitude. Moreover, the R square value was 0.599 which depicts that the model explains 59.9% of the variance in adoption intention.

The hypothesis tests if subjective norms doesn't has any impact on the adoption intention. The dependent variable adoption intention was regressed on predicting variable subjective norms to test the hypothesis H2, adoption intention significantly predicted subjective norms, $F(1, 189) = 68.746$, $p < 0.001$, which indicates that the visual appearance can play a significant role in shaping adoption intention ($b = 0.470$, $p < 0.001$). These results clearly direct the positive effect of the subjective norms. Moreover, the R square value was 0.599 which depicts that the model explains 59.9% of the variance in adoption intention.

The hypothesis tests if perceived usefulness doesn't has any impact on the adoption intention. The dependent variable adoption intention was regressed on predicting variable perceived usefulness to test the hypothesis H3, adoption intention significantly predicted perceived usefulness, $F(1, 189) = 54.952$, $p < 0.001$, which indicates that the perceived usefulness can play a significant role in shaping adoption intention ($b = 0.170.$, $p < 0.001$). These results clearly direct the positive effect of the perceived usefulness. Moreover, the R square value was 0.599 which depicts that the model explains 59.9% of the variance in adoption intention.

Conclusion:

The independent variables in the study are Visual appearance(H6), Trust(H5), Perceived Ease of use(H4), Perceived Usefulness(H3), Subjective Norms(H2), Attitude(H1) and adoption intention is the dependent variable. The regression test is applied on the data and it was found that there is no impact of H4, H5 and H6 on the adoption intention. The variables which are having impact on the adoption intention are H1, H2 and H3.