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CONSUMER OPINION ON CLOUD GAMING IN INDIA

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ABSTRACT

Cloud gaming, the ability to play any game irrespective of its size and system requirements from any device and place without any expensive hardware. This concept that has been around since the early 2000s but never really took off due to several reasons such as technical constraints, the gaming market share owned by giants like Sony, Nintendo and Microsoft whose entire business model was based on selling gaming consoles. But now the gaming industry is at a very pivotal point where a lot of innovations are taking place in cloud gaming, companies like Google, Microsoft and Nvidia are pouring in a lot of resources on their cloud gaming services. Although, gaming consoles are still a thing but several cloud gaming services have been launched. These have managed to generate a lot of buzz and intrigued a lot of people from the gaming community. In this study, we'll analyze several facets of this service and interpret whether the Indian audience is ready to adopt this mode of gaming and let go of the traditional consoles.

Keywords: Gaming, Cloud-gaming, Indian consumers, Digital services, Graphics, Computers.

I. INTRODUCTION

The gaming sector in India has been booming for the past decade or so. Be it on the computer, gaming consoles or Mobile phones the number of gamers in India has increased significantly across all platforms. As a result streaming games online on platforms such as YouTube, Twitch has become an important income source for a lot of people so much so that many teenagers and novice gamers see gaming as an aspirational career option. Indian online gaming market currently stands at USD 290 million, and is poised to grow to USD one billion by 2021 (KPMG India, Google, 2017). The significant of gaming as an industry can mainly be attributed to the availability of extremely cheap mobile data, in fact India was named the cheapest country for one gigabyte of data with the average cost in U.S. dollars only coming to $0.26 (McCarthy, 2019). The current market scenario is heavily dependent on hardware based gaming which requires the users to have all the physical hardware with them in order to play the game and this has created a huge problem as with every new wave of improved gaming experience there has been a subsequent increase in the hardware requirements such as storage and thus increased the costs of owning the hardware and with the new generation of consoles such as the PlayStation 5 and XBOX series X coming in 2020 these constraints are just going to become more obvious. For some perspective the expansion storage for the new XBOX is going to cost $219.99 (Good, 2020), that is a huge price tag for a storage drive and will become a necessity for the user if he/she wants to store more games on their console. All these costs will have to be paid up for eventually and this is not an economically feasible option in the long run. This significant graphical improvements with every generation is bound to create a problem in the long run and as a result cloud gaming is emerging as an alternative, cloud gaming is the only way to make gaming cheaper and accessible for the wider audience. Cloud gaming eliminates the need of owning proprietary hardware such as gaming consoles or gaming computers. All an user needs is a decent internet connection with the speed ranging from 15-35 Mbps (Krewell, 2020) and a device such as a smartphone to play the game on the actual game is running on the company severs and is streamed over to the user's device. To put it simply, it is the live streaming for a game that you are operating (Haider, 2019) It also gives the user the ability to play the same game across all his devices, what this means is that a particular game can be started on a smart television at home but when in outdoors, the gamer can continue the game from the exact same point where he had stopped playing previously, this offers so much flexibility and makes the entire experience so smooth. Silicon Valley giants have realized the huge potential that cloud gaming has and as a result have invested a lot of resources in order to come up with their own subscription based cloud gaming services. The major cloud gaming services right now are Google's Stadia, Microsoft's xCloud, Nvidia's GeForce Now among many others, these services work like an OTT subscription, the user pays the monthly charge and can log into the system and choose the game they wish to play, the game will run on the company's server (Sam Moore, 2020). Having discussed all the positives of this possible "future" of the gaming industry. There is one

major caveat due to which none of these major services have been introduced in India as of now, and that is internet speeds and data limits. Despite having the cheapest 4G data plans in the world the internet speed in India is the slowest across the club with averaging out at 6 Mbps (Doval, 2018). In such a completely online only system like that of cloud gaming even the slightest lag can ruin the overall experience. Hence, it is very important to know what Indian consumers think about this entire concept and are they ready to adopt it.

II. OBJECTIVES

The objectives of this research are twofold. Firstly, we find whether the Indian audiences, particularly millennials are aware about the concept of cloud gaming as it is bound to enter the Indian markets sooner or later and checking the degree of product awareness in India is a very important step in order to figure out whether the Indian consumers are ready for the product. We will also look at what percentage of the audience are interested in gaming and whether the gamers and non-gamers would be ready to try out these services. Secondly, we will look at whether the audience has the minimum bandwidth in order to smoothly run these services, this will give us an idea about the practicality of cloud gaming.

III. HYPOTHESIS

Hypothesis 1: Is the Indian audience aware about the concept of cloud gaming?

H_o- The Indian audience is aware about cloud gaming.

H_A- The Indian audience is not aware about this concept.

Hypothesis 2: Is the Indian audience interested in trying cloud gaming themselves?

H_o- Indian audience wants to try cloud gaming.

H_A- Indian audience is not interested in using cloud gaming.

Hypothesis 3: Do the people have the minimum bandwidth to run these services?

H_o- The Indian audience does have the minimum bandwidth to run cloud gaming services.

H_A- The Indian audience does not have the minimum bandwidth to run cloud gaming services.

Hypothesis 4: Is there no impact of age on gaming in India?

H_O – There is no impact of age on gaming in India.

H_A – There is an impact of age on gaming in India.

Hypothesis 5: Is there no impact of gender on gaming in India?

H_O – There is no impact of gender on gaming in India.

H_A – There is an impact of gender on gaming in India.

IV. LITERATURE REVIEWS

Offline gaming vs cloud gaming (online gaming)

This study focuses on how cloud gaming is emerging as a more practical alternative to offline gaming that the consumers are using and how it offers us better hardware, the researcher goes for a comparative analysis between cloud and offline gaming in different sections. Since 1980s the video game industry has been under constant growth, then in 1990s Sony's Playstation and Nintendo introduced 3D graphics to the market and that took the industry to a whole new level, games now had great visuals. Gaming is beneficial for individuals as it helps in boosting memory, problem solving skills among many other areas. Offline or the traditional form of gaming requires the gamer to buy his own system which must include processor, RAM, Storage, an operating system and other important components in order to run applications. Computers with good specifications are used for intensive tasks such as gaming. Every game has different requirements such as graphics, storage and these just increase with every generation of improved games. This is the major problem with offline gaming that the features which are top of the line now may become obsolete very soon. For instance over the past decade storage requirements have increased at almost unbelievable rate, back when Microsoft launched their original XBOX it came with 8 GB storage but now at least 50 GB has become a norm paired with fast RAM and graphics. Cloud gaming however, is a very different service, here games are delivered to the player over the internet by very powerful servers that may be located on the other end of the globe. Here, there is no need of owning a gaming PC or a gaming consoles. The only requirement is a decent system to run the cloud gaming

software and a good internet speed. The recommended internet speed is 15 Mbps for a smooth experience. Cloud gaming is independent of the operating system that is used, the same game can be played across all types of devices. The author concludes that cloud gaming is a better platform then online gaming with a disadvantage that there is a constant need of high-speed internet connection.

Developing cloud business models: A case study on cloud gaming

This paper talks about the overall growth and development of cloud based business models and particularly focuses on the cloud gaming sector for this purpose the authors critically studied the journey of G-Cluster a cloud gaming services offering company. The authors state that business models are considered to be something that is fixed and describe a company's activities in the operating market, but these models are subject to a constant change in order to still remain relevant to the market. So a product that is successful today may not enjoy the same level of success tomorrow. To explain this statement even further the authors chose the gaming industry for their case study as it represents the media as well as the software industry, in particular the company Game cluster (G-Cluster) was studied and the various reasons and the various changes that their business model had to go through since the company's inception in the year 2000. The company delivers games to their customer's devices such as set-top box, PCs streamed over broadband internet. But in their initial phase i.e. from 2000-2003 it spent it's time with product development and getting in talks with potential partner. In 2003, it focused on the marketing and sales, and porting several games to work on other platforms for instance running a console game on a PC. In 2005, the company entered the Internet Protocol Television market, but failed as they couldn't reach to a lot of consumers, they even tried working together with network operators to develop sales channels but that didn't work out as G-Cluster was a very small firm so they added other mediators such as set-top box manufacturers. During this time their service was mainly used by PC users and the revenue was shared among portals, game licensors and network operators. In 2010 g-cluster removed all the mediators as they started offering everything themselves, they now had their own store, software development kit (SDK) for game developers using which gamers could be made exclusively for the G-Cluster platform and this way G-Cluster can assure the quality of the games. The research concludes that for success in the software as a service (SaaS) market there should be proper positioning in the market and developing the business model in such a way that all the partners are benefitted, this will reduce the threat of competition by new firms as they won't be able to get the same market share.

Playing High-End Video Games in the Cloud: A Measurement Study

This authors of this paper conducted a comprehensive measurement study for CloudUnion which is the leading service provider of cloud gaming in china, using this study the authors successfully pointed out the potential flaws in their current approach. The paper starts off the analysis b going over the facts that how cloud gaming is better than traditional form of gaming, wherein the players have no other option but to update their hardware on regular basis just so that they can play the latest games, but cloud gaming is no longer just a distant dream and is taking the shape of reality. Cloud gaming gives the gamers a lot of features such as playing any game just on internet connection, no need to worry about compatibility issues on and lastly no need to worry about downloading or installing the major games. The benefits are not just restricted to the end users but even the publishers will easily be able to manage digital rights (Mir Mohammad Azad, 2010) and stop malpractices such as piracy. The measurement was done in two categories active and passive, for CloudUnion's active measurement the authors had to understand the proprietary protocol used by the company, for which they collected a large amount data by having several gaming sessions and analyzing communication between the clients i.e. end device and servers. In passive mode, the traffic was captured between servers and clients. Several aspects of online gaming are reviewed that can affect the overall user experience during online gaming. First one of them being video frame rate as it is responsible to provide a smooth gaming, the fluctuation in the frame rates with time was observed, the observation showed that there were constant spike in the download rate meaning the frame rates weren't really stable. This instability could be attributed to the fact that the video codec used by CloudUnion is x264 which produces large frames once in a while but when the speed is good enough for the given codec the frame rate is stable. The second influencing factor is video latency which is the time difference between when the gamer operates and when the same is reflected on the player's device. This can be attributed to reasons such as delay in network, delay in processing, or play out delay (Kuan Ta Chen,

2011). There were only a few delays observed which led to short interruptions as the frame rate was mostly at 20 frames/sec. One major problem that might not apply to every service would be the sync on video and audio as the service CloudUnion encodes audio and video separately, hence the sync between them can be a reason of ruining the experience, what was observed that due to occasional network issues the lag is comparable in video and audio and the synchronization is still maintained while due the processing delay is much higher or audio when compared to video. To conclude, there is an obvious problem in CloudUnion' service which means that constant innovations should be maintained to keep up with increase in user demand and video rate strategy used by the company is affecting the final quality and should be optimized to perform well in various bandwidth constraints.

A Survey on Cloud Gaming: Future of Computer Games

In this paper, the authors talk about the cloud gaming from different aspects, these aspects consist of optimization techniques, commercial uses among many others. The recent developments in cloud gaming are also discussed. The authors attributed the tremendous popularity of this technology to the stakeholders of this technology such as gamers, developers and service provides. For gamers, the technology gives them the ability to play their games anywhere, purchase rent games on demand and avoid updating the hardware periodically. For the developers, there's benefits such as making games focusing solely on one platform, avoid paying huge cuts to retailers, increase their reach to more gamers and the most important avoid piracy and lastly for the service providers cloud gaming offers a totally new business model, demonstrate the potential of cloud based services. The entire cloud gaming service can be executed in three steps integrating cloud gaming platforms, measurement studies on QoS and QoE metrics. The first step i.e. system integration means providing an easily usable platform for developers can be quite challenging this is because it has to be cross platform usable hence making its entire nature quite heterogeneous, the author clearly states that there is a trade-off between a complex interface and optimization. The second step i.e. QoS or quality of service evaluations, it helps in quantifying the performance of these platforms this quantification is done by analyzing energy consumption i.e. how well the decoding of audio and video taken place and secondly network metrics, because in a completely online based service the user experience is highly affected by network conditions. The third and the last step is QoE or Quality of Experience Evaluations, this particular metric is subjective. Further on the authors carefully study optimizing the cloud gaming platforms which can be further divided into cloud gaming infrastructure and communications. Cloud server infrastructure helps in managing the massive user base for such services, so this area should be pretty strong in terms of the quality and optimizations, it can be optimized by allocating resources efficiently among servers or create a new distributed structure so that the entire load is not just on one server. Elaborating on resource allocation, the allocated resources on high performance data centers keeps on growing thanks to the high demand and extensive use of such streaming based multimedia applications and hence an efficient or smart allocation should be done to keep the efficiency of public as well as private data centers or clouds, another aspect of infrastructure is the distributed architecture, it is of extreme importance due to the cloud gaming's clients spread across the globe if the design is not taken care of it'll fail to reach the target client as and when needed. Under the optimization, communications is the other crucial aspect due to this widely spread network of data servers and clients there has to be an efficient communication system in place the study done in the research for communications can be classified into two groups data compression algorithms and the transmission adaptation algorithms. In data compression the gameplay footage has to be compressed before it is streamed over to the players over network there can three compression schemes that can be adopted such as video compression, graphics compression and a hybrid compression which combines video and graphic compression, under adaptive transmission even though the data has been already compressed the data transmission rate has be reduced so as to make the experience smooth and instantaneous. Coming to the most important aspect of this research that is commercialization and business models of cloud gaming services, as discussed earlier as well G-Cluster (G-Cluster [Online], 2017) was the first one to start the cloud gaming service and other companies followed suit and came up with services such as OnLive, GaiKai (GaiKai [Online], 2015), GameNow (GameNow [Online], 2015). In summary, the researchers conclude that the recent advances have made the cloud gaming concept a reality and more optimization techniques gradually

make it even more practical, hence it is safe to assume that a new era of cloud gaming eco system might be right around the corner.

Cloud gaming: a green solution to massive multiplayer online games

This particular research goes in of the green efficiency that the advent of cloud gaming can bring about in the overall gaming landscape. The green efficiency can brought by aspects such as software management as installing and updating the software at only one location i.e. the server makes the process cost effective as well as requires less effort and resources, hardware maintenance is another aspect as we have discussed previously that the with every new generation of more graphical intensive games the current hardware becomes obsolete and not that capable of running the game at its maximum output and hence their rises the need to buy new more powerful hardware this process or rather need of new hardware generates a lot of unnecessary electronic waste and cloud gaming totally eliminates the need of new hardware and there's also a reduction in power consumption as the major power heavy computation is done on the servers and the last aspect of green efficiency in cloud gaming is the deployment cost what this means that it totally eliminates the huge cost of sales and distribution. The study further on dwells on the green design of cloud gaming i.e. the energy efficient design of the entire cloud gaming service in general. The design first component is the green cloud data center where the game applications, graphics are rendered and video is coded for streaming over network to the client. The second component is "energy aware graphics rendering", graphics are essential for a smooth gaming experience but this rendering process can be quite taxing on the system, but by optimizing the rendering on cloud systems energy efficiency can be achieved, Nvidia has introduced systems like GRID and SHIELD which perform efficient rendering in clouds servers with good GPUs. The third component is "energy efficient video compression" the video that is received by the use has to g through a process of compression but this raises a trade-off between rate of optimization and the overall distortion but a better rate distortion performance is achievable when power consumption is unlimited. The last component is "Green communications and networking". There are some promising directions that the cloud gaming design can take one of them is HTML5 which gives the ability for graphic processing in browsers by the help of a technology called WebGL hence offering a one stop homogeneous platform for rendering, coding and network optimization. To summarize a perfect balance of cloud data center, energy efficient graphic rendering, video compression and proper communication over networks in necessary for cloud gaming while at the same time also ensuring energy efficiency.

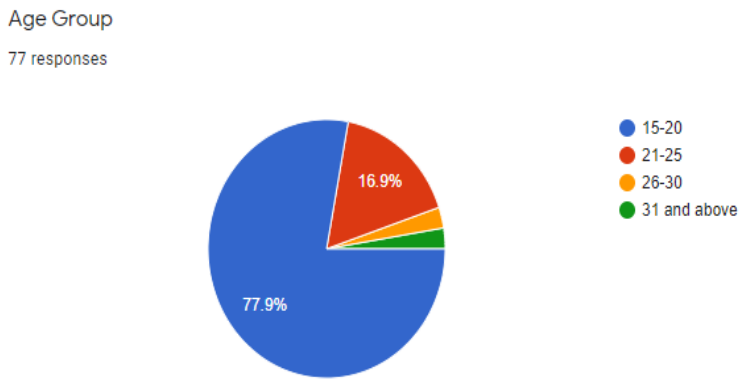
The future of cloud gaming

This research analyses what can be the paths that cloud gaming can take in the coming future. Cloud gaming has been around for a very long time i.e. since 2000s, many startups such as OnLive and GaiKai envisioned this potential future long before people actually knew about it. In the initial days due to several technological constraints and overall limited scales of these companies the success of cloud gaming was subjected to a lot of doubts, the first question was that how will these companies fight with the major players of gaming industry such as Sony, Microsoft and Nintendo, and will they let go of their profit margins in physical consoles but with time all these companies realized that perhaps this might be the next big thing and it became even clear when Sony acquired GaiKai in the year 2012 and introduced their own cloud gaming service PS Now. But still there are more challenges in the path and the technology haven't been perfected yet. The current approach of running unmodified games in cloud servers and streaming it from cloud gaming servers has been widely adopted the researcher describes this approach as type-I, but this is not an integrated solution and hence is not a perfect solution, integrating the game software with the cloud from the very beginning should be ensured and is written as Type-II and III solution. Further on the author makes a makes a few forecasts about cloud gaming's progress and analyses them in depth. The first forecast analyses the possibility of most cloud gaming services shifting towards a type-II approach, this will ensure properly optimized programs to run the these services which can be easily deployed and won't need any changes by a third party. A move to type-III may be made eventually which is relatively quite complex to implement. The second forecast is about taking time to figure out the charges for these services, the current pricing is not ideal. A service named OnLive charged $15 every month which turned out to be very low as the customer base was isn't large enough to make the company sustainable with this price while PS Now charged $20 per month but the games had to be rented separately

which was as good as purchasing the retail copy. Hence, figuring out the right pricing model might still take time. The next forecast is about giving other services based on the technology of cloud gaming for instance people can preview an app by using it even before they download the same and many other similar services can make cloud gaming much more useful in places other than the gaming industry. Another possibility for online gaming can be more multiplayer games which would ensure fairness as the game can't be manipulated, the last two forecasts talk about an improved interaction between players and observers and the convergence of technologies such as Augmented Reality (AR) and Virtual Reality (VR). To conclude, the paper emphasizes on the fact that it is the right time for cloud gaming to penetrate the gaming market and holds a lot of potential if they figure out the proper approach they should take about it.

V. RESEARCH METHODS AND METHODOLOGIES

A total of 77 responses were collected from different populations of several age groups as the research tries to analyze the scope of cloud gaming service in the country and that would need an understanding the opinion of several age groups on this technology as well. They were different populations not just on the basis of their ages but also on the basis of other factors such as belonging from different educational institutes, different locations and from different social classes in terms of their opinion on the gaming concept as a whole and there interests in the same as these factors highly affect their chances of availing this service and their awareness about the same as well. For example, most of the students from Christ (Deemed to be University) are exposed to gaming either through their peers or already had an interest in the same, this is evident from their ownership of dedicated gaming devices such as gaming consoles, gaming laptops and they also have access to high speed internet hence the responses given by them might show their awareness of the gaming and their ability to use the cloud gaming service while not worrying about internet, although that does not imply in any way that they are aware about the concept of cloud gamin it just reflects that they can experience this service as and when this enters the Indian market. Similarly this aspects would change for different people from coming from different places. To get the most accurate results with relevance to the study taken up I decided to go ahead with qualitative research designs for this study while also trying to implement non parametric tests like chi-square for testing of two hypothesis of this research. A chi square test is a non-parametric test and it helps in determining independence between categorical variables using which we'll see whether there is any evident connection between the variables where the test is used. As far as a qualitative research is concerned, it doesn't totally depend on the non-numeric data i.e. data gathered from sources such as questionnaires, interviews or documents, and while testing some hypothesis the questionnaire was designed in such a way that the result from final responses were sufficient to make an appropriate conclusion.



The samples have been collected in such a way that it was distributed to people from all types of age groups from several locations and social standards irrespective of their prior awareness about gaming or their current involvement. The research is done to understand the actual responses on opinion of the people who filled in their responses. Although there was no limit to the age limit in filling the survey still there was a clear observation that the maximum responses were from the age group 15-20, as they have the maximum exposure to technology and are evidently the most active members of the gaming community.

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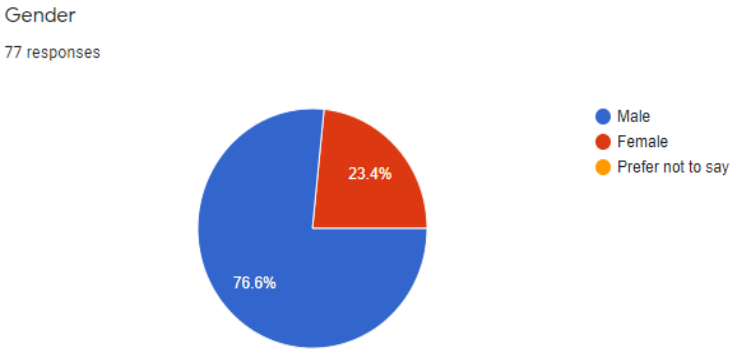

The data was collected from a total of 77 people who belonged to different age groups, the sample included people from both the genders male as well as female although a third option was given in gender category but there were no responses to that option, the age group was divided into four groups 15-20, 21-25, 26-30, 31 and above. To get an unbiased and right sample with honest answers, I've used probability sampling for the testing of hypothesis in this study and under this stratified sampling techniques has been used. The questionnaire was randomly distributed to the target population.

VI. FINDINGS

The market research at the time of this analysis had 77 respondents out of which all the responses were proper hence none of them had be eliminated. Through this research, I have made a lot of observations in fact every question in the questionnaire helped me in making a strong conclusion, be it about cloud gaming or just gaming in India. When asked about how interested you into are gaming and what are your reasons for the same, almost 87% actually said that they used to game for reasons ranging from professional gaming, on a regular basis or casual game play that is done very occasionally while at the same time there were 13% of the respondents who never indulged in gaming at all. When asked the gamers about their preferred platform for gaming using a multiple choice question, 64.9% of the respondents chose their mobile devices such as tablets and phones as their platform of choice and it seems logical as everybody already own the device and hence don't have to make any special investments, the second most preferred platform was computer and laptops with 58.4% of the users choosing to play on them while 35.1% of the respondents stuck with gaming consoles that are dedicated devices made for this very purpose and as gaming consoles are a type of luxury so not everyone can afford it hence it become the least preferred option seems reasonable. This observation was further even justified when just 29.9% of the total respondents expressed that they own a gaming console, while a whopping 70.1% didn't own a gaming console. Coming to the most important questions that'll help us in making proper conclusions in this research, the questionnaire explained in very brief the meaning of cloud gaming and asked whether the people already had an idea about what cloud gaming is 37.7% said yes they were already aware of this concept, 41.6% had no idea about it previously while 20.8% had heard of it but there was no other info available, there was also a question about whether they had ever heard of any of the mainstream cloud gaming services active in other countries and the responses consisted of names such as Google's Stadia, Microsoft's X-Cloud, Nvidia's GeForce Now, Vortex, Azure, but there were also 44.2% of the people who had no idea. Coming to those questions which helped in gathering qualitative data for hypothesis testing, we informed the people through a note in our survey that the minimum net requirement is 15-20 Mbps in order to smoothly run cloud gaming, and asked after that whether they have such internet bandwidth and 76.6% of the respondents said that they do have the bandwidth to run the service successfully. The next important question is to know whether the Indian consumer is willing to give up 5 GB of data for every hour of cloud gaming session, now this is where it gets quite interesting as in the initial part of this paper itself we had assumed that the data caps in India would be a great hindrance in this service's success and would stop people from using it and the responses help in cementing this assumption as 61% say that they won't give up that much data for an hour's gaming session. The last question of this questionnaire asks people whether they would be interested in using this service and 59.7% of the people said that they would like to try it out while the rest i.e. 40.3% were not interested. The other two hypothesis which had to be tested statistically are done below using chi-square tests and cross-tabulation:

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Testing of Hypothesis using Chi-Square tests

A) Impact of Age on Gaming

H0: There is no impact of age on gaming

H1: There is an impact of age on gaming

Table 01 - Age * Gaming Crosstabulation

Count

		Gaming				Total
		Casual Gamer (Play Occasionally)	Not into gaming	Professional Gamer	Regular but not a professional	
Age	15-20	36	5	3	16	60
	21-25	6	4	1	2	13
	26-30	1	0	0	1	2
	31 and above	1	1	0	0	2
Total		44	10	4	19	77

Table 02 - Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.864[a]	9	.450
Likelihood Ratio	8.138	9	.520
N of Valid Cases	77		

From the above table, it is evaluated that the computed value for chi-square is 8.864, whereas the tabulated value using 5% level of significance is 16.919. Since, the computed value is lower than the tabulated value, we accept our null-hypothesis and reject the alternative-hypothesis. Hence, it can be interpreted that there is no impact of age on Gaming.

B) Impact of Gender on Gaming

H0: There is no impact of gender on gaming

H1: There is an impact of gender on gaming

Table 03 - Gender * Gaming Crosstabulation

Count

		Gaming				Total
		Casual Gamer (Play Occassionally)	Not into gaming	Professional Gamer	Regular but not a professional	
Gender	Female	6	9	0	3	18
	Male	38	1	4	16	59
Total		44	10	4	19	77

Table – 04 Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	28.942[a]	3	.000
Likelihood Ratio	25.616	3	.000
N of Valid Cases	77		

From the above table, it is evaluated that the computed value for chi-square is 28.942, whereas the tabulated value using 5% level of significance is 7.815. Since, the computed value is higher than the tabulated value, we reject our null-hypothesis and accept the alternative-hypothesis. Hence, it can be interpreted that there is an impact of gender on Gaming.

VII. HYPOTHESIS TESTING OUTCOME

1. The Indian audience is not aware about this concept.
2. Indian audience wants to try cloud gaming.
3. The Indian audience does have the minimum bandwidth to run cloud gaming services.
4. There is no impact of age on gaming in India.
5. There is an impact of gender on gaming in India.

VIII. LEARNING OUTCOME

- To understand the consumer perspective for a particular service that hasn't entered the market and is restricted in a specified geographical location.
- The curiosity of consumers to try a new technologically advanced innovation.
- Feasibility of cloud gaming in India when it has not entered the Indian market.
- Analysing the gaming industry of the Indian market.
- Knowing the technical intricacies of a streaming based service such as cloud gaming.
- Understanding the fast paced customer trend changes.

IX. LIMITATIONS OF THE STUDY

Just like every other paper there is a scope of improvement here as well and with reference to other papers on cloud gaming this paper has touched upon a new aspect of research conducted on gaming in India and as a result as I believe has opened a whole new forum for research on several aspects of cloud gaming with respect to the Indian market. When such an untouched topic is researched upon there definitely are a lot of limitations which as a result give rise to new researches in a similar field. The limitations of this paper would be firstly that there were not enough responses that would help me in backing the test results of my hypothesis and hence leaving a room for error but due to the time constraints I had to go ahead with the result analysis that according to me is the biggest limitation of this particular study. Researching on cloud gaming in Indian market raised another issue and that is lack of relevant literature, there was ample of literature to go through when it comes to cloud gaming but all of them were written by foreign authors and none of them were formulated with keeping Indian market in mind but I feel that the problem will soon go away as well, whenever cloud gaming increases its presence in India.

X. CONCLUSIONS

Through this research paper, we have made a couple of conclusions. India although making progress on the internet speed front still lacks the service that would ensure a smooth running of internet heavy service like cloud gaming and hence not making sense for an average person to start using cloud gaming whenever it enters the Indian market. The biggest obstacle for cloud gaming in the country would be the presence of data limits in the internet plans over here, cloud gaming is assumed to burn through 5 GB of data for every one hour of gameplay on an average and although the internet is extremely cheap in the country the data cap won't result in a good experience and on top of that even the internet speeds that Indians get are pretty inconsistent and highly volatile this would lead to a tremendous lag in the game's footage delivery from the cloud server to the user's device. The other important conclusion is the level of awareness about this service amongst the Indian

audience, although many companies such as Sony, Google and Microsoft are trying to commercialize cloud gaming as a service and are putting in a lot of resources to do so, the Indian audience is still not unaware of it as concluded after the hypothesis testing majority either don't know about it at all or have just heard of it, according to me this is mainly due to the fact that this service hasn't entered the Indian market yet and as soon as that happens this problem will be solved. The gaming industry is on the brink of a new revolution and if the analysts are to be believed then this new generation of consoles coming this year might very well be the last generation of proper hardware upgrades after this generation all the resources will be allocated to cloud gaming architecture. But that is something still to happen and only time will tell whether Cloud Gaming is here to stay or will it fade away with time and never really make an impact on the gaming industry

XI. SUGGESTIONS

The future researches which focus on cloud gaming in India can touch on several aspects such as the core technical feasibility of cloud gaming i.e. the core technical architectural limitations due to which the service can feel limited in a lot of ways. This will give future researchers an outlook of all the short comings that the cloud gaming technology has but also lead them on a path to come up with strategies using which these problems can be resolved

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