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Virtual Rape: An Emerging Crime in Cyberspace

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ABSTRACT

Since cyber technology is changing everyday, the way of crime committed using it is also changing thus putting the users who use technology in harms' way. One such crime is Virtual Rape. In the simplest manner virtual rape can be termed as when a person is sexually assaulted or is a victim of sexual harassment but not in the physical world rather in the cyber world. The cyber world is already being threatened with different kinds of cybercrimes but it also needs a reformation for the concept of virtual rape as well. The virtual rape although does not happen physically but the online character or avatar of a person in any online platform gets sexually assaulted by other characters present online. As of now there is no law available to curb such crime, because till now we have not been able to define virtual rape as to what would constitute such crime and what are the ingredients necessary to conclude that a crime of virtual rape has been committed.

This paper will be divided into six parts. The first part is introductory and will discuss about what is rape. The second part will discuss about the cyber world. The third part will discuss virtual rape and even though it has not been defined as of now what should be a basic definition of virtual rape. In the fourth part we will reflect upon the technical aspects related to virtual rape. In this chapter we will also discuss what are the technical flaws as of now due to which such crimes are committed. The fifth chapter will focus on the legal aspects related to the crime of virtual rape and the laws that need to be made in order to declare such acts as crime against people. This chapter will try to provide a legal definition of virtual rape that may come within the scope of both criminal laws as well as cyber laws. Apart from this, the chapter will also try to look upon any existing laws related to virtual rape and what are the changes that need to be made in order to provide a strong legal system against such crimes. The final chapter will discuss the conclusion and suggestions that need to be given against such acts of crime.

Keywords: *Cyber World, Rape, Sexual Assault, Virtual Rape, Virtual Reality.*

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I. INTRODUCTION

Rape has been considered as one of the most heinous crimes in the world. It destroys the modesty and integrity of the victim and although the victim may somehow recover from the pain and suffering due to such an act but they live in the psychological pain and a fear for the rest of their lives. They suffer from different kinds of trauma throughout their life. For instance, the landmark case of Aruna Shanbaug[4] can be taken as an example of the medical problems a victim suffers after she becomes prey to such a crime. Aruna Shanbaug slipped into vegetative state for the rest of her life because she was victim of sexual assault by the hospital janitor in which she worked as a nurse and that the Hon'ble Supreme Court of India although legalized passive euthanasia in this case there was no near family to perform the act and the only family, she had was the hospital where she was admitted and they denied to shut down her life support systems. However, the accused of the case was imprisoned for the crime of assault and robbery and was imprisoned for assault and robbery. His crime for sexual assault was not proven and was not declared guilty. Through this case we can come to the understanding to certain points: the conviction rate for crimes of rape is very less; there is not only the physical wound that the victim goes through but they also suffer from mental trauma as well.

Before we jump into the topic of Virtual Rape, we need to identify that Virtual Rape is similar to that of the actual crime of rape and that there are no differences between them. We also need to differentiate between sexual assault, sexual harassment and rape and while doing so we will need to connect virtual rape to the definition of rape that is accepted worldwide.

- **Sexual Assault:** Any kind of sexual contact with other person without their consent is called, sexual assault. It may include anything from non-consensual physical touch to other person to using physical force on another person's private part. In general, sexual assault may be considered as an umbrella term in which any and all kinds of non-consensual sexual acts and behaviors are included.[5]

- **Sexual Harassment:** According to Convention on Elimination of Discrimination Against Women (CEDAW), the General Recommendation No. 19, Violence Against Women in its Article 11 states that, *'sexual harassment includes such unwelcome sexually determined behaviour as physical contact and advances, sexually coloured remarks, showing pornography and sexual demands, whether by words or actions'*[6]

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[4] Aruna Ramchandra Shanbaug v Union of India & Ors.; 2011 (4) SCC 454
[5] What Is Sexual Assault? | CARE Program (ucr.edu)
[6] https://www.legal-tools.org/doc/f8d998/pdf/&ved=2ahUKEwi4r8KY2dX

Further, sexual harassment has also been identified as any form of sexual advances towards other person or request for sexual favors and other verbal and physical harassment. Sexual harassment although means sexual behavior towards other person but it also includes negative sexual comments towards another person.[7]

Some forms of sexual harassment include:

- *Making conditions of employment or advancement dependent on sexual favours, either explicitly or implicitly;*

- *Physical acts of sexual assault;*

- *Requests for sexual favours;*

- *Verbal harassment of a sexual nature, including jokes referring to sexual acts or sexual orientation;*

- *Unwanted touching or physical contact;*

- *Unwelcome sexual advances;*

- *Discussing sexual relations/stories/fantasies at work, school, or in other inappropriate places;*

- *Feeling pressured to engage with someone sexually;*

- *Exposing oneself or performing sexual acts on oneself;*

- *Unwanted sexually explicit photos, emails, or text messages.*[8]

- **Rape:** According to several organisations such as **United Nations Office on Drugs and Crime (UNODC)**[9], **European Institute for Gender Equality**[10], **U.S. Department of Justice**[11], **SAGE Reference (The Multimedia Encyclopedia of Women in Today's World)**[12] all define rape as an act in which a person has sexual intercourse with other person against his or her will. Sexual intercourse although defines that there should be penetration but it also defines the penetration to be oral or vaginal as any form of penetration comes under the purview of rape.

Through the definitions above mentioned it is quite clear that every form of sexual crime that a person has to go through is to be defined as Sexual Misconduct and it is an umbrella term for

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[7] Sexual Harassment | RAINN
[8] *Ibid*
[9] Microsoft Word - ICCS final 2016-04-22_FINAL.docx
[10] rape | European Institute for Gender Equality
[11] Office of Public Affairs | An Updated Definition of Rape
[12] Rape, Legal Definitions of : Encyclopedia of Women in Today's World

all kinds of crimes towards the victim in which the perpetrator makes sexual advances in any form.[13] [14]

Further we also need to define the different stages of crime and also their importance in the crime such as rape.

- **Intention (Mens Rea):** This is the stage in which a person in his completely sound mind plans to commit the crime even though he knows that it is unlawful and is fully aware of the consequences that his actions may cause or will cause once the crime is done.

- **Preparation:** This is the stage in which the person starts preparing to commit the crime by making his plan and then collecting all the required materials which are needed in order for the commission of such act.

- **Attempt (Actus Reus):** Once the person is fully equipped with all the requisites of the crime, he moves on to the next stage i.e., attempt to commit the crime. Attempt to commit the crime is an offence. Attempt is a crime even if the attempt fails because the person was fully prepared and had further proceeded to complete his motive.

- **Commission:** After attempting to commit the crime the final stage of crime is commission. Attempt and Commission of the crime are almost the same with only difference being that when the crime is completed it comes under the definition of commission.

II. THE CYBER WORLD

For a very long time our world existed with the means of communications as letters. But then came the era of computers, which slowly but with its own pace started changing everything in our world. This pace of change was initially slow but it gradually increased and soon technology started taking over everything.

Then in the year, 1969 a team of scientist while working for Advanced Research Projects Agency of the U.S. Department of Defense created ARPAnet (Advanced Research Projects Agency Network) the world's first internet of its own type.[15] It allowed the computers of U.S. military to communicate between each other and share information and resources over telephone lines. In order to do so, the data was broken into bits and sent over into packets which was received over by the other computer and the same process was further repeated.

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[13] Sexual Misconduct | Center for Health Education & Wellness
[14] What is sexual misconduct and violence? - Report + Support - Durham University
[15] ARPANET Definition, History & Significance - Lesson | Study.com

Since ARPAnet used telephone wires for the means of communication its range was not too far. Later in 1989, Tim Berners Lee while working at CERN discovered a way through which data could be shared over the internet to any computer in any part of the world. He created World Wide Web (www). Through this means, any person hosting data on his computer could share it to any other person's computer. This was a major step in changing the way of communication and sharing of data. Our modern-day internet is completely relied on World Wide Web as any person seeking any information, can gather it using internet. This helped in changing our internet to different generations and making it faster and more reliable.[16] This online world is known as cyberspace or cyber world or virtual world.

We have been provided with a mode of technology which has unlimited potential and has given us the power as to how we use it for our well-being but as it is said that, "People Corrupt Power," similarly people use internet for their own benefits even if the ways they are using it is wrong or unethical thus, giving birth to cybercrimes such as online frauds, salami attack, hacking, cyber scams, etc.

III. DEFINING VIRTUAL RAPE

Although there is no well-defined term called as Virtual Rape it is a very new concept in today's day-to-day life of emerging crimes in cyber world. The cyber world is already threatened due to many crimes and we do not have solution to all the crimes that also everyday some new way to threaten the cyber world keeps on popping up everyday. If in such situations, a new crime emerges then the legal body controlling the cyber world will go out of control in controlling and securing the safety and privacy of the people who are connected online due to such illegal acts being committed online.

The concept of virtual rape basically means when a person is sexually assaulted not in the physical manner rather online in the cyberspace. This concept of virtual rape first came into notice in 1993 in a Multiple User Dimension (MUD) program known as LambdaMOO (Lambda MUD Object Oriented) which as of today is the oldest MOO program available. This program allowed users to interact to each other through avatars as there were no images or graphics available. The users just needed to program their avatar and interact with other users. *"A person named Mr. Bungle had created a 'voodoo doll' and performed certain acts on the cyber space that were falsely attributed to the other people in the community. He made certain acts through the avatar which were sexually obscene or violated the sexual privacy of the other users' avatar*

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[16] A short history of the Web | CERN

online. This act has been considered as the first act of virtual rape."[17] Further in 2016, in another online game known as QuiVR, *"a player was sexually assaulted within the game itself by another player who tried to touch the private parts of the player's character. The player stated that as soon as she entered the game the other person started chasing her around in the game itself and made sexual gestures. Apparently, she had to quit the game itself."*[18]

Virtual Rape can also be understood from the fact that the most recent crime related to virtual rape is that of a girl who was sexually assaulted in the Metaverse platform known as Horizon Venues.[19] This is a platform in which people connect to each other through their avatars using the virtual Reality headsets also known as VRs. As the name suggests the VR allows a person to feel the virtual reality by using the headset. Any kind of injury felt by the avatar in the virtual reality is felt by the person through vibrations. *A girl who joined Metaverse was sexually assaulted within sixty seconds of joining this online platform. Her avatar was assaulted by a group of three or four people and they even took photos of her character while committing the act. The haptic feedback of the online platform using VR gave a real-time experience to the victim which was very traumatic and she immediately turned off the system not knowing what to do.*[20]

These cases give us an idea that people using various online platforms for gaming or connecting to other people by means of making their online characters also known as avatars are being sexually harassed online by other people by manipulating the programming of the system or through different vulnerabilities present in the online platform. With this in mind we can give a basic definition of virtual rape as, *"sexual harassment which does not occurs in physical world rather takes place online with the character or the avatar of the person depending on the online platform can be termed as virtual rape."*

IV. TECHNICAL FLAWS THAT LEAD TO VIRTUAL RAPE

Now that we have a basic idea as what virtual rape is, we need to look at the reason behind the occurrence of such crime or in simple words as to what is the reason that these acts take place. Virtual rape although is a new concept the key factor for this act or crime is due to some of the technical flaws in the online platform or glitches available in the system. Apart from this, other reasons that can be considered as the key aspect of such crime is the lack of appropriate

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[17] Controlling the Virtual World (stanford.edu)

[18] dspace cover page (unimelb.edu.au)

[19] Assaulted in Metaverse: Woman alleges 'gang rape' 60 seconds after joining Meta's virtual world - Technology News (wionews.com)

[20] *Ibid*

monitoring of these platforms due to privacy issues.

As we have already seen in the previous chapter of this paper there have been instances in the past due to which people were sexually assaulted online and these acts took place because of glitches available in the system. There have been other instances of online sexual harassment such as harassment of a girl's avatar being sexually harassed on an online gaming platform known as Roblox. *In 2018, a 7-year-old girl who was playing game on the online gaming platform known as Roblox had to face sexual harassment when the game was hacked by a person and this allowed two male characters to allegedly rape the girl's avatar online.[21]* Although Roblox accepted that their protection systems were compromised due to which such act was committed and that they would fix the vulnerabilities and would also find the attacker of this case but the main issue that arises is that what are the technical flaws that are available in the system that allows a person to commit such acts and how should they be dealt with.

One of the main technical flaws as we have already understood is the fact that there are vulnerabilities present in the system. Apart from this, many times there are certain loopholes that are present in the back-end of the programming of the program or the platform that is getting compromised. These technical flaws are very easily exploited and the attackers use these as the main and the easiest way of attacking any program. These technical flaws however can be easily remediated in real-time to all the users using the program or who are using the online platforms by providing an update to the software which will fix the bugs available in the program thus, making the system more secure which are prone to these activities. Apart from this there are several other ways through which a user may bypass the system and use the flaws of the machine to commit such acts. Some of them are:[22]

- **Broken Access Control:** Access Control means who or what is authorized to perform specific tasks in an application. If we talk about in sense of online applications access control allows the users to perform specific tasks only on the platform based on their authorization. For example: a general user may be allowed to perform functions on the front-end of the application whereas, the users on servers are allowed to perform actions on the back-end of the program as well.[23]Broken Access Control allows users to perform actions outside of their allowed designations such as: access, modify, or delete data they shouldn't have access to. This happens due to improper way of managing sessions, and

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[21] Roblox responds to the hack that allowed a child's avatar to be raped in its game | TechCrunch
[22] OWASP Top Ten | OWASP Foundation
[23] Access control vulnerabilities and privilege escalation | Web Security Academy

lack of security updates.[24]

- **Cryptographic Failures:** Cryptography is the new technique to secure an application or website by the developers. It involves a secure key using cryptographic algorithm to generate a password which is either a random bit string of a length specified by the cryptographic algorithm or a pseudorandom bit string of the required length that is computationally indistinguishable from one selected uniformly at random from the set of all bit strings of that length. Cryptographic failures can directly lead to vulnerability in security of the application and also the theft of data of other users from the database. Failure in cryptographic password can also allow attackers to modify the data of the application or the way the application works.[25]

- **Injection:** As the name means, an Injection attack occurs when an attacker inserts any malicious code or program into an application to execute unauthorised commands or access databases through improper ways. Injection attacks are of various types such as SQL Injection, Command Injection, XML Injection. Injection attacks have various targets such as corrupting the entire system, executing unauthorized codes in programmes which affects data security and application logic. Injection attacks also have consequences when it is deployed on web servers and its effects include the way the server responds while working.[26]

- **Insecure Design:** Insecure design in a program leads to any user gaining access to the unauthorized sectors of the program to modify the way the program works or responds to different commands. Design of the program is the most basic part of any program and due to some unknown factor if the very base of the program is flawed it may lead to improper working of the entire program. And if any attacker gets to know about such way of insecure designing in the program, they may use it to modify the way the program behaves and the attackers in this scenario also have the authority to lock the admin out of the system.[27]

- **Security Misconfiguration:** Security measures are used by the web application hosts to secure their application, system and servers. Now if there is even a slight misconfiguration in the security systems it may lead to compromise in the entire system. The security misconfiguration may occur in various ways such as not updating the

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[24] Broken Access Control: Attack Examples and 4 Defensive Measures
[25] What Is an Injection Attack? | CrowdStrike
[26] What Is an Injection Attack? | CrowdStrike
[27] Insecure Design | Tutorials & Examples | Snyk Learn

security patches, flies and system not being encrypted, misconfiguration in the cloud servers and web applications, lack of access controls.[28]

- **Vulnerable and Outdated Components:** These components are outdated and are not used by the developers who initially designed them. Using such components by any organization for making a web application of their own poses a higher risk as these components do not get any security update and are thus vulnerable to more attacks. These components can only prevent attacks of the previously known exploits but are more susceptible to new exploits and will not be able to recognize them as threats.[29]

- **Identification and Authentication Failures:** This security flaw refers to the state in which the computer system fails to authenticate a user correctly and provides access to any person using the same credentials access to the system. This is a major security flaw as any person who might have access to the credentials of any user may be able to access the system and may do any act, he/she wishes leaving no trail behind. In order to prevent such attacks many security measures have been added such as CAPTCHA **(Completely Automated Public Turing test to tell Computers and Humans Apart)** systems, multi-factor authentication, secure password reset systems, etc.[30]

- **Software and Data Integrity Failures:** Software and Data Integrity failures occurs because today most of the applications are built using modules, plugins, libraries. These are extracted from unknown repositories and many times these plugins or modules are not verified in its original form which is its source code and are used without checking the base code of the module. If the code is weak or has used any outdated plugin the final form of the program also becomes weak and is easily vulnerable and attackers may use it to breach the security of the entire program.[31]

- **Security Logging and Monitoring Failures:** Although Security Logging and Monitoring is not directly linked to attacking any web application or software but it is necessary to monitor all logins and all failed logins. If the logs are not being monitored it may lead to impact visibility, incident alerting, login failures, system failures and breaches.[32]

- **Server-Side Request Forgery (SSRF):** A SSRF attack involves an attacker targeting

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[28] Understanding Security Misconfiguration: Types, Examples, & Prevention Tips | Balbix
[29] OWASP A06 Guide: Eliminate Vulnerable, Outdated Threats - Vumetric
[30] OWASP Top 10 Identification and Authentication Failures
[31] software-data-integrity-failure-prevention-guide-en.pdf
[32] Server-Side Request Forgery (SSRF) | Common Attacks & Risks | Imperva

applications that use URLs to import data or read data from URLs. The attackers by way of manipulating servers through these URLs access data and modify them. SSRF attacks have impacts such as Exposure of Data to attackers or public at large, Remote Code Execution (RCE), Denial of Service (DoS), etc.[33]

These are some of the many ways through which an attacker may breach the vulnerability of the web applications and online games to modify the data or use the loophole present in the online platforms to commit crimes such as virtual rape.

V. LEGAL ASPECTS OF VIRTUAL RAPE

Since there is no well-defined law related to Virtual Rape the legal aspect of this concept as of now is very broad but at the same time it is very narrow as well because of lack of definition of virtual rape. Regardless of this a legal point of view related to this topic is being provided here.

As we have already discussed that there is no well-established definition or law related to virtual rape we will have to discuss about its definition from the very beginning as to what should be the major steps that are to be taken once such crime is committed and comes into notice of the law enforcers.

When the law enforcers are notified about the commission of such crime they should immediately act and take all the necessary steps to collect as much data as they possibly can and it should be preserved in such a manner that it can be used for investigation purposes without fail. This is to done through the principle of CIA (Confidentiality, Integrity and Availability). For example, the computer system of the victim along with all the accessories that were connected to the computer system should be seized of the victim. Before doing that, the data collection team should make an exact replica of the victim's computer's data such as the system's internet browser history, cookies, internet settings, computer's IP and MAC address, its model number, etc. After that they need to find out the application through which the victim was harassed online and collect its cache memory.[34] They can use all this data to re-trace the back-end request of the application and the MAC address of the system which responded with the request. The MAC address will help the investigators to find out the device which was used to commit such crime. It is also important to note that in any case of collection of digital evidences the networking devices of the computer systems are to be stored in Faraday Bags so that they can be cut-off from all kind of outside wireless networks.

After finding the device of the perpetrator the next issue that arises is to find the perpetrator

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[33] Server-Side Request Forgery (SSRF) | Common Attacks & Risks | Imperva
[34] Collect Physical Evidence in computer forensic investigation | Infosavvy Security and IT Management Training

because a device may have many users and a device can also be illegally authorized by any third-person who knows the password of that computer system. In case the computer system has multiple users or the computer system was illegally accessed by any other person the burden of proof lies upon the original user of that computer system by proving his alibi. Also, the investigation for the forensic team then becomes a bit difficult as finding the accused who used the credentials of the original user is not easy.

Now that we know about the basics of the investigation procedure that should be followed in order to investigate the crime of Virtual Rape the next thing that we should move onto is what law should be implemented once the perpetrator has been caught.

As we have already discussed in this paper that Virtual Rape although may not be same as the actual cases of rape but the traumatic experience it leaves on the user is almost the same. From the cases we discussed above it is quite evident that the victims of these cases were very disturbed due to their experience of such act and that too on an online simulated environment where they least expect such act the victims are sure to be disturbed enough that they would not prefer using such application again and neither would they recommend it to anyone. And as there are no laws for such crime the previous rape laws should be modified for the time being unless a more well-established definition is formed and new law is passed for such act.

VI. CONCLUSION & SUGGESTIONS

Virtual Rape although does not take place in physical manner it is still a crime because any person who commits this act in his sound mind committed such act and even though all that the person did was, rather than disturbing the victim physically they were assaulted in the cyber world using online characters such as avatars on various platforms even though the person committing the act knew what the outcome of their act would be. The person committing such act had an idea that through such act he/she is involving the person on the other side in some kind of obscene act and that too without their consent. The person also committed the act for his own sexual gratification and led the victim to undergo some sort of mental disturbance. All this proves that even though virtual rape is something that is still just a theory and has occurred in certain incidents there is very high probability that this crime can increase in the future and thus, strict rules and regulations are needed in order to control this crime and above all a definition is needed which can be accepted worldwide to understand what Virtual Rape is and the gravity of the crime.

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