

The Cyberstalking Cases in Cyber World using for Cybercrime & Computer Forensic Investigations

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Abstract—In recent years, the internet is the technology which is quickly adopted and it is a most universal electronic world of information and communication technology (ICT), its continuously expanding into every sector of today's lives, such as public, private, government and business sectors & influencing our daily lives as provided on a globe scale. The advancement of developing by cyber world for our better future, but cybercrime is destroying our advance technology plans due to the use of ICT and become a most concerning issue for international criminology. Cybercrime is a criminal offence, it is a crime that is committed using the ICT, internet and computer networks. Cyberstalking is one of the cybercrime that receiving empirical attention nowadays, it is committed by the use of the internet. It also referred as a crime against a particular person called victim and harasser stalk the victim by unwanted communication through the internet. In this paper, we are going to describe cyberstalking and representing the statistical data of cyberstalking. Studied 1357 cyberstalking cases for 5 years that shows the majority of victim were female (73%) and the most affected age group is 18-30 (36%). The probability of the harasser is more in males (42%), there is a prior relationship with the harasser (51%) and 47% harasser related to the victim are their Ex. The majority of cyberstalk victims are single not married. The harassment begins with different medium of communications mostly by Emails (31%). Only 68% victim report the harassment cases.

Keywords: cybercrime and cyberstalking.

1. INTRODUCTION

Nowadays The Internet continuously expanding its reach into life of humans, we can't imagine our live without it. The internet changes every day, it provides the opportunity to work and live better as well as influencing the daily lives. There are lots of the internet user who are regular user in cyberspace for various purposes such as educational, professional, commercial, and socialization. Since IT sector boom and access to the internet at home at affordable prices also increases internet suffering and the popularity of social networking. Internet increases users Tendencies to share their personal data and details, Personal pictures and Opinions about the world. The user's become online friends with strangers, blindly trust on them and giving full access to their

profile. Computer forensics is a type of forensics investigation regarding crimes committed using digital world, internet, computer and use of electronic media, they investigate crime such as cybercrime. Such forensic field developed due to the introduction of new technologies and computers, which is readily accessible & affordable. Cybercrime is a criminal offence and committed using the ICT, computer networks, and electronic means. It is a huge problem in all over the world. The law enforcement is scrambling to catch up harasser, the legislators are passing new laws for such cybercrime, improved and increased resources, and police agencies are forming special computer forensic & crime units and pushing their officers to become more technically stronger and providing specialized training to their officers. Cyber stalking is a new type of cybercrime which received empirical attention. Cyber Stalking is a crime that uses technology to harass victim in a variety of ways, it involves acts of an individual over times that are threatening, potentially dangerous and harassing behavior by Internet, websites, social networking sites, E-mail, or by other electronic communications.

2. CYBERCRIME

Cybercrime is the most concerning and burning issue because it harms confidential data & privacy. Cybercrime is a criminal offence and criminal activity and committed using the ICT, internet, computer networks, and electronic means. Some human mind are criminal by nature, they use the internet and computer as a tool of crime that referred as cybercrime committed in cyberspace. It is a huge problem in all over the world and its growing faster day by day. The law enforcement is scrambling to catch up harasser, the legislators are passing new laws for such cybercrime, improved and increased resources, and police agencies are forming special computer forensic & crime units and pushing their officers to become more technically stronger and providing specialized training to their officers. However, cybercrime is too big and face extraordinary challenges that it can't solve alone by police.

Cybercrime mainly consist of unauthorized data access, stolen the funds and property, data modification, & data destruction.

3. CYBERSTALKING

Cyber stalking is a type of cybercrime and form of mental assault, which received empirical attention. Cyber Stalking is a crime that uses technology to harass victim in a variety of ways, it involves acts of threatening, potentially dangerous, blackmailing, mental abuse and harassing by E-mail, Internet, social networking sites, or by other electronic communications. Cyber stalking represents deviant and unwanted behavior of one person to another and it engenders fear in the victim. We can define cyber stalking as “the use of the Internet as a means of unwanted communication to stalk someone/victim”. Cyber stalking rate has increased enormously in the past few years due to technology and the spread of the Internet at globally. The technology makes it easier for cyberstalkers to harass their victims and providing a new method of committing crime because they don’t need to physically confront them. The Internet access, Email, instant messaging, social networking sites and other communications technologies available easily that enables cyberstalkers to conceal their identities.

3.1 Types of cyberstalking

Email cyberstalking: It is an easiest and free way to stalk victims by direct Communication with the victim through E-mail, it involves surveillance, telephoning, and sending virus, high volume of electronic junk mail and mails.

Cyberstalking by Internet: It takes on a public (not private) dimension. Stalkers use global communication to slander and endanger their victim by using the Internet.

Cyberstalking by computer: The unauthorized control by another person to control over the computer of the targeted victim. When victim connects to internet the cyberstalker communicates directly with their victim and control the victim’s computer. The defensive option for the victim of such cyber stalking is to disconnect and relinquish their current Internet address. The technology available that enable real-time keystroke logging and view the victim’s desktop in real time.

3.2 Types of cyberstalkers

Easy obsessional stalker: The stalker with a personality disorder/abuse problem, they may be suffering from some mental illness like schizophrenia, who is former romantic partner refuses to believe that their relationship is over or Rejecting partner to be punished (How dare she/he reject me, he/she have to pay for it) or the injustice at work place or anywhere like How dare she/he fire/insulted me.

Love based stalker: It is a kind of cute/romantic behavior at starting like showering the victim with cards, flowers, endless phone calls and emails. They take victim as an object of love

to be won at any cost. The stalker is in love with the victim and want victim to love them back.

Rejected/revenging stalker: The stalker don’t move on from a terminated relationship or a relationship rejection with victim and come up with desires for reconciliation and revenge like “How dare victim dump me! I’ll teach a lesson, I won’t let you forget me like this”. The relationship is not over from stalkers side.

Sexually driven/predatory stalker: This is a serious behavioral pattern stalking such as serial rape, they pursue victim specially women to have sex with them by consensual/forcefully.

Unrequited love stalker: The stalkers who haunt the object of their affections, the victim refuses to their love.

Spouse/partner stalker: The better half or one partner stalk another partner by mean of verbal abuse, damage to property, and physical violence.

Sadistic/dangerous stalkers: The harasser gets pleasure from terrorizing and intimidating their victims, they can’t be controlled and highly dangerous for the victim.

3.3 Purpose of cyberstalking

The purpose of cyberstalking are false accusations, acquiring a new relationship, false victimization, intimidation, harassment and encouraging others to harass the victim,, coercion, and/or punishment of a prior relationship rejection, Corporate cyber stalking Motives to desire for financial gain or revenge, Attempt to gather personal information about victim, Stalking motivated by power and control, Monitoring the target’s online activities and attempt to trace IP address, To insult the victim, Attempt to damage the victim’s reputation, Ordering goods & services on behalf of others and Attacks on data and privacy via data modifications.

3.4 Laws against cyberstalking

In India, The cyberstalking provision used mostly to regulating is section 72 and 72A in year 2008 stated in the Indian information technology act. The Indian Penal Code Section 441 and in year 2013, S.354D added in section 441 by the Criminal Law Amendment Ordinance.

Section 72 Breach of confidentiality and privacy. section 72A The Punishment for Disclosure of personal data: this Act stated, anyone who has access to any material that contains personal data about another person, with the intent to cause public, knowing that it cause wrongful loss/gain, without the consent of the person concerned, such person shall be punished with imprisonment for 3 years, or with a fine 5 lakh rupees, or with both.

The Indian Penal Code Section 441: Whoever enters into the property of another with intent to commit an offence, to intimidate, and insult any person in possession for such

property, or having unlawfully entered into such property, is said to commit crimes.

The Criminal Law Amendment Ordinance, the Indian Penal Code in 2013 year added S.354D to punish the cyber stalking. This law stated: Whoever follows a person/ contacts person for personal interaction repeatedly despite a clear indication of disinterest by victim (person) or whoever monitors/watches/spies the person from the internet, email, and by electronic communication in a manner that results in fear/violence/distress, in the mind of person who are victim or interferes with the mental peace of victim, commits the offence of cyberstalking and shall be punished with imprisonment of either description for a term which shall not be less than one year but shall extend to 3 years and shall also be liable to fine.

3.5 How to protect yourself from Cyberstalking

- People don't share their personal information in public dimension, anywhere at online and never give it to strangers, including e-mail or chat rooms.
- Never use name/nickname as user ID and password.
- Meeting with online persons take cautious like meeting should be in a public place and take a friend with you.
- Make sure that your ISP have an acceptable-use policy that prohibits stalking and respond to your complaints.
- When an online situation arrive such as hostile, log off that and do internet surfing elsewhere. If a situation occurred that you get feared, than contact with police and local law enforcement agency.
- When you are receiving unwanted contact and calls than you should clear to that person that you don't like them and don't contact you again.
- Save all conversations and communications for evidence, don't edit/alter them and keep a record of it.

3.6 Statistic data of cyberstalking cases

In year 2007 to the year 2011 there are Total 1357 cases recorded, all these cases taken for study of cyberstalking analysis that helps in computer forensic investigations. The 249,234,220,349, and 305 cases in year 2007, 2008, 2009, 2010, and 2011 respectively (shown in table 1). There is a rise in cyberstalking cases in year 2010(fig 1).

Table 1: Number of cases used for statistical data

Year	2007	2008	2009	2010	2011	Total
Number of cases	249	234	220	349	305	1357



Fig. 1 Histogram showing the total number of cases

3.6.1 Victim's characteristic

Victim's characteristics are details regarding victim that help in effective study for forensic investigations of cyberstalking cases. These are divided into three parts age of the victim, gender of victim and marital status of victim.

a) The Age of victim: The age group is divided into four parts, these are 18-30, 31-40, 41+ & unknown (the age of victim is not mentioned in case). The number of victims belongs to which age group in a particular year (shown in table 2). The majority of victim belong to age group 18-30 i.e. 36%, 41+ is second highest group with 30% victim belongs to this age group, there are 28% victims belonging to 31-40 age group and only 6% are unknown (fig 2).

Table 2: No. of victims belongs to Age group according to year.

Age of Victim	2007	2008	2009	2010	2011
18-30	69	87	74	144	107
31-40	59	53	67	101	100
41+	70	75	70	96	98
unknown	51	19	9	8	-

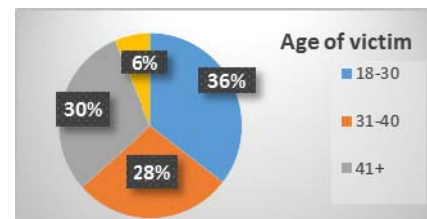


Fig. 2: Pie chart showing percentage of victim's age group

Table 3 Detail of Gender of victims according to year

Gender of Victim	2007	2008	2009	2010	2011
Female	151	168	171	271	227
Male	51	50	47	67	78
unknown	47	16	2	11	--

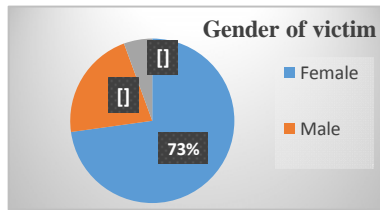


Fig. 3 Pie chart showing gender percentage of victims.

b)The Gender of victim: The details regarding the gender of victims who cyberstalked in a particular year are shown in table3. Gender of victim divided into 3 groups: female, male and unknown (gender not mentioned in case). The majority of victims are female i.e. 61%, 72 %, 78%, 78%, and 74% in year 2007, 2008, 2009, 2010 and 2011 respectively. An overall 73% victims are female in five year data analysis (fig3). The male victim have lower percentage that is 21% and only 6% are unknown.

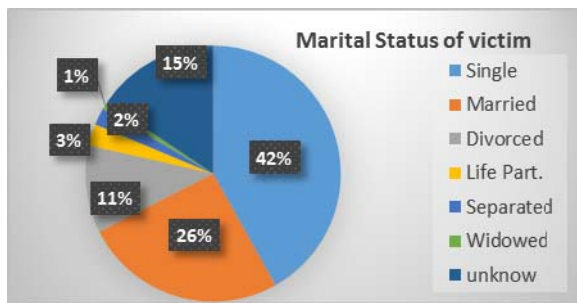


Fig. 4: Pie chart showing victim’s Marital status percentage.

Table 4 Detail of Marital status of victim according to year

Marital Status of Victim	2007	2008	2009	2010	2011	total
Single	79	74	94	160	161	568
Married	68	43	60	98	79	348
Divorced	20	27	21	40	42	150
Life Part.	7	4	4	10	12	37
Separated	2	4	4	13	6	29
Widowed	6	1	1	0	5	13
unknown	67	81	36	28	-	212

c) Marital status of victim: The victim’s marital status stated into 7 categories these are single, married, divorced, life partner, separated (not divorced but dont live together), widowed, and unknown. The majority of victim of cyberstalking are single 42% and lowest victim belongs to widowed only 1%. Whereas married victims are 26%, 15% unknown, 11% divorced, 3% life part, and 2% separated.

3.6.2. Characteristics of Harasser

The harasser’s characteristics describe the mentality of the stalkers and describe a group that are more harasser, this help in systematic investigations of cyberstalking, they are divided

into three categories these are gender of harasser, any prior relationship of victim with harasser, and if yes what was the relationship between victim and the harasser.

Table 5 Detail of Gender of Harasser according to year

Gender of Harasser	2007	2008	2009	2010	2011	total
Male	97	97	99	156	122	571
Female	73	73	76	126	102	450
gang	-	-	-	21	-	21
Unknown	79	64	45	46	81	315

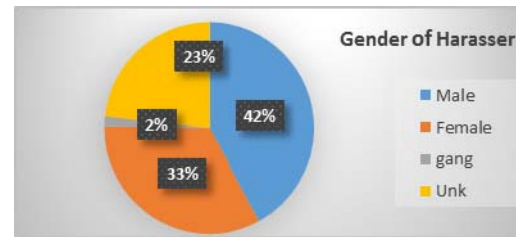


Fig. 5 Piechart showing gender percentage of harassers

a) Gender of harasser: the harasser gender is a important characteristics, it divided into four categories, it shows that the tendency of cyberstalker is more in males as compared to females. The 5 years cyberstalking statistics show that majority is males 42%, females are 33%, gang stalkers or rape is 2% and a large part of 23% is unknown in case.

Table 6 The Year Wise Details of Prior relationship of victim with harasser/stalker.

Prior relationship with harasser?	2007	2008	2009	2010	2011	Total
No	140	100	86	185	180	691
Yes	109	134	134	164	125	666

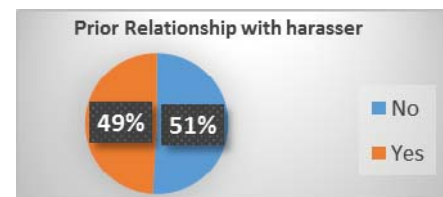


Fig. 6 Piechart shows Prior relationship of victim with harasser

Table 7 The Year wise Details of the relationship between harassers/ stalkers and victims.

If yes, what was the relationship?	2007	2008	2009	2010	2011	Total
Ex	34	59	58	90	70	311
Family	14	11	19	11	16	71
Friend	15	8	10	12	16	61
Online Acq	30	11	30	20	9	100
Work	7	9	11	13	9	49

Neighbor	3	5	2	4	3	17
School	2		4	6	2	14
Landlord	1			4		5
Tenant				1		1
Business	3			2		5
Online dating		26				26
other		5		1		6

b) Any prior relationship of victim with harasser: here, we have to find out that there is any pervious/prior or current relationship between the victim and harasser. The majority of 51% (fig 6) cases in 5 years is stated that Yes there is a relationship between the victim and harasser.

c) What was the relationship between harasser and victim: In the previous table (table6) if yes about that there exist a relationship between the victim and the harasser than in this category we used to clear what type of relationship between these two. Here I have described 10 relations can be exist between the victim and harasser (table 7). It is used to show that majority of EX (Ex-boyfriend/ Ex-girlfriends) are cyberstalkers or harasser around 47%, stalkers are online Acq is 15%, 11% harasser are belonging to family, 9% harasser are friends, 7% harasser are belonging through work, 4 % cyberstalking due to online dating harasser, 2% are neighbors, 2% from school, 1% are landlord, 1% from tenant, and 1% others.

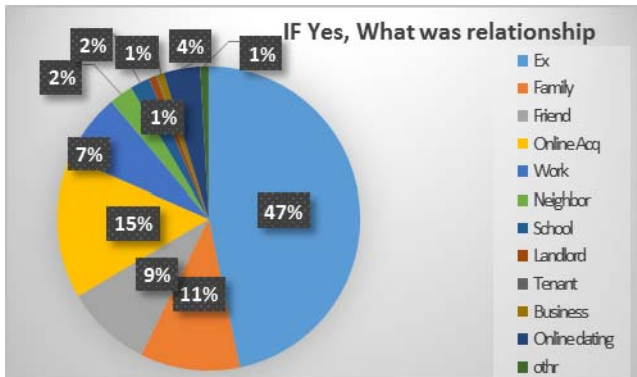


Fig. 7 The Piechart showing the percentage of relation between victims and harassers / stalkers.

3.6.3. Details regarding Harassement

The cyberstalking is a kind of harassment and the details of harassment is an important aspect of cybercrime investigations because it tells the main arise reason of such crimes and are they solved or registered yet. It is divided into 3 categories these are how the harassment begins, did victim report the harassment and to whom they report.

How harassment begin?	2007	2008	2009	2010	2011	Total
Email	57	84	74	115	97	427
Facebook	2	3	11	56	48	120
Web site	13	12	14	16	32	87
Texting	4	-	6	14	22	46
Msg board	30	27	20	33	21	131
Blogs	31	5	5	6	13	60
Chat	12	12	12	10	12	58
Impersonation	13	-	-	5	11	29
Key log /Virus	-	-	-	6	11	17
Twitter	-	-	3	1	10	14
IM	25	19	27	19	8	98
Gaming	4	-	6	1	9	20
YouTube	-	6	3	3	5	17
Auctions	-	-	5	2	3	10
Craigslist	8	4	6	7	1	26
Dating	-	-	6	6	1	13
Myspace	11	13	11	16	1	52
EBay	9	2	-	-	-	11
Phone	12	17	6	20	-	55
Mail list	8	-	-	2	-	10
Personal	-	6	-	-	-	6
Hacking	-	-	3	-	-	3
Guestbook	4	-	-	-	-	4
other	6	24	2	11	-	43

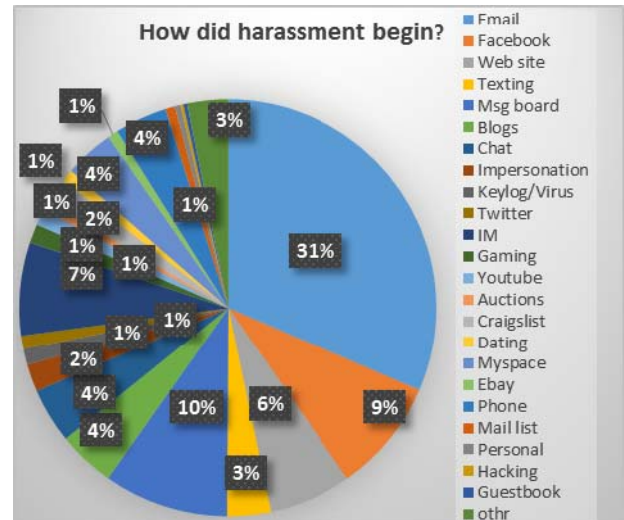


Fig. 8 Piechart showing how did harassment begins?

a) How the harassment begin: A very important thing to investigate in crime is to detect the rise of crime, especially in cybercrimes, as already less number of clues or proof against criminal activity. Here defined 24 category of how the harassment begins or the medium of communication that give birth to cyberstalking crimes. The harassments or cyberstalking begins majorly by emails 31% recorded as 427 cases in 5 years (table8) register cyberstalker are harassing the victim by sending emails and junk mails, 10% by message

Table 8 Year wise Details regarding how the harassment begins

board, 9% by Facebook around 120 cases, 7% by IM around 98 cases in 5 years, 6% by websites, 4% by each of these categories blogs, chats, phone, Myspace. 2% are impersonation, 2% are craigslist, rest all are 1% cases registered in 5 years, these are virus, twitter, gaming, YouTube, auctions, dating, EBay, Mail list, personal, guestbook, hacking and 3% for others (fig8).

Table 9 Year wise Detail that did victim report the harassment

Did victim report the harassment?	2007	2008	2009	2010	2011	Total
Yes	147	164	158	213	236	918
No	102	70	62	136	69	439

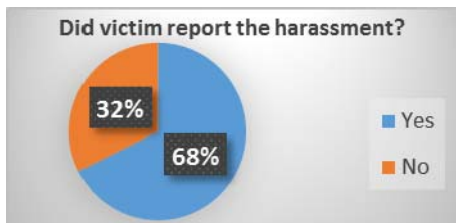


Fig. 9 Piechart show how many victim report harassment case

Table 10 Year wise Details that to whom the victim reported for cyberstalking or harassment.

To Whom they Report	2007	2008	2009	2010	2011	total
ISP	23	30	72	87	128	340
Police	-	-	75	114	102	291
Lawyer	3	-	5	11	6	25
School	-	-	2	1	-	3
Law enforce	64	72	-	-	-	136
Web admin	17	21	-	-	-	38
Moderator	19	10	-	-	-	29
Myspace	5	10	-	-	-	15
EBay	7	5	-	-	-	12
Craigslist	3	4	-	-	-	7
other	6	12	4	-	-	22

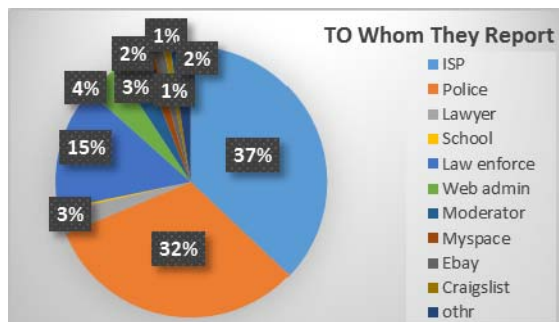


Figure10 Piechart showing to whom victim reported about stalker

b) Did victim report the harassment? : Out of 1357 cases recorded in year 2007 to 2011 only 918 cases are reported to any authority who can deal with cyberstalkers (table 9). Only 68% cyberstalking victims (Fig. 9) whom reported a case against cyberstalking in year 2007 to 2011 (5 years). Rest 32% cyberstalking victim don't report any case against cyberstalker due to any reasons like fear, reputation ,mentally disturbed or ill, unaware of they are victim of cyberstalking, etc.

c) To whom they Report: To whom the cyberstalking cases are registered by victim. The cyberstalking victims reported to ISP and police mostly in 5 year cases. There around 340 cases of cyberstalking registered by the ISP and 291 cases registered by Police (table 10). In 37% cases cyberstalking victim reported to ISP and 32% cases where victim reporting cyberstalking cases to police (fig 10). 15% or 136 cases reported to law enforce, 4% or 38 cases reported to web admin, 3% cases reported by victim to each lawyer (25 cases) and moderators (29 cases). My space and eBay recorded 2% cases each and rest all are 1%, others 2.5%.

4. CONCLUSION

Cyberspace increases the cybercrime due to lack of awareness about cybercrimes, lack of TMT (training, manpower, and time), don't have the technical expertise to pass effective laws, people unaware of nature of attacks and trends of the victimization, limited information about laws regarding cybercrimes and rights of victim. The peer pressure, legal system, and emerging technologies, can be used to prevent victim from cybercrime such as cyberstalking. People need to use their common sense and work with sensibilities in cyberspace. The majority of victim were female (73%), male harasser are more (42%),in most of the cases harasser is ex of victim and the most affected age group is 18-30 (36%). The harassment begins with different medium of communications mostly by Emails (31%).

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