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A contribution to study of cyber crimes in India

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Abstract

Cyber crime is the most pertaining issue for all developed and developing countries, as it harms confidential data as well as people in daily life transactions. In this paper we have discussed some aspects of cyber crimes of India. We have analyzed that, cyber crimes are independent of age group. Also we are providing some basic statistics and a comparative study of cyber crime for India's biggest IT centre's like Andhra Pradesh, Karnataka, Kerala, Maharashtra and Madhya Pradesh. Section 1.1 gives idea about introduction of cyber crime, 1.2 and 1.3 provide methodology and analysis of data and section 1.4 contains general conclusion of the analysis.

Keywords: Cyber Crime, IT Act, IPC Sections, Chi Square test

1. Introduction

In 1820, Joseph-Marie Jacquard, a textile manufacturer in France, produced the loom. This device allowed the repetition of a series of steps in the weaving of special fabrics. This resulted in a fear amongst Jacquard's employees that their traditional employment and livelihood were threatened. They committed acts of disrupt to discourage Jacquard from further use of the new technology [1]. This is the first recorded cyber crime. Cyber crime term is used to describe criminal activity in which computer or computer network are a tool or target of criminal activity to denial of service attack. It also includes traditional crime in which computers are used. Cyber crime mainly consists of unauthorized access to data and data alteration, data destruction, theft of funds or intellectual property.

For this paper we have downloaded data from www.data.gov.in. This contains a six years cyber crime data (2008 to 2013) for India. This data has classified according to their age group and states of India. The statistics on Cyber Crimes are collected under the following heads,

- i) Offences registered under the Information Technology Act 2000.
- ii) Offences under the IPC

2. Methodology: In order to test independence of two attributes (Age group and offences under acts) we use Chi square test of independence [6].

Chi square Statistic given as follows

$$\chi^2 = \sum_{i=1}^c \sum_{j=1}^r \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

where

O_{ij} = actual frequency in the i-th row, j-th column

E_{ij} = expected frequency in the i-th row, j-th column

r = number of rows

c = number of columns

3. Analysis: By observing the data carefully we came to know, that, large number of cyber crimes happened in between age group 18-30 and 30-45 represented in Table 1. As we were curious to know whether the cyber crimes are independent of age groups. In order to test hypothesis, we applied a chi square test [5] of independence in Table 2 as follows,

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Table 1

Age Group	<18	18-30	30-45	45-60	>60
Cyber crime related IPC sections	21	736	822	252	16
Total IT act	120	2351	1250	233	17

H₀: The cyber crimes are independent of age groups'

Table 2

Conditions	Observed	Expected	Deviation
18-30 Cyber crime related IPC sections	1184	932.2632	67.97587
18-30, Total IT act	3541	2154.737	891.861
30-45 Cyber crime related IPC sections	1425	625.7368	1020.911
30-45 Total IT act	1972	1446.263	191.1126
		Chi Sq	2171.861

Chi square Statistic given as follows

$$\chi^2 = \sum_{i=1}^c \sum_{j=1}^r \frac{(O_{ij} - E_{ij})^2}{E_{ij}} = 2171.861, P \text{ value}=0$$

The Chi-square statistic is 2171.861. The P value is 0. This result is significant at $p < 0.05$. It means, we reject our null hypothesis.

The two Tables number 3 and 4 are representing persons arrested under the IT Act 2000 and the IPC section

Table 3: Under IT Act 2000 [2, 3]

State \ Year	2008	2009	2010	2011	2012	2013
Andhra Pradesh	5	8	81	242	170	296
Karnataka	6	21	95	34	66	94
Kerala	32	47	105	135	151	151
Madhya Pradesh	8	24	49	97	152	165
Maharashtra	58	78	143	226	324	426

Table 4: Under IPC section [2, 3]

State \ Year	2008	2009	2010	2011	2012	2013
Andhra Pradesh	105	4	126	25	69	17
Karnataka	0	0	22	5	14	10
Kerala	0	0	4	5	24	18
Madhya Pradesh	0	2	10	6	45	12
Maharashtra	2	89	64	85	83	177

Cyber Crimes –under IT Act, 2000

Total cases registered under IT act 2000 were 4356 in 2013. When state wise observations were carried out Maharashtra state was on first rank where 681 cases were registered followed by Andhra Pradesh (635), Karnataka (513), Kerala (349). While total cases registered during 2008 was 288. There were a large number of increments in the cases registered during 2013.

In all, 178 persons arrested under IT Act during the year 2008 as compared to 2098 during the year 2013. In 2008, 3% persons arrested from Andhra Pradesh, while in 2013, 14%. Karnataka arrested 3% and 4% persons in 2008 and 2013 respectively. There is an 11% (18%, 7%) declining in number of persons arrested in Kerala during 2008 to 2013. There is a 3% (5%, 8%) raise in number of persons arrested in Madhya Pradesh during 2008 to 2013. Maharashtra has the large number of persons arrested of all the above states IT centers. It had 33% in 2008 and 20% in 2013.

Cyber Crimes – under IPC (Indian Panel Code)

In 2013 total cases registered under IPC section were 1337. Out of these Maharashtra has 226, Andhra Pradesh has 16, Karnataka has 20, Kerala has 34, Madhya Pradesh has 60 cases registered during 2013.

A total of 1203 persons arrested under IPC section during 2013. Maharashtra has arrested 1% during 2008 while 15% during 2013.

4 Conclusions

Following are some important observations from the data given,

1. Under the IT act a total of 2098 persons arrested all over India during 2013. Out of these 2% from age group below 18, 57% from 18-30, 34% from 30-45, 6% from 45-60 and 1% from above 60 age group have arrested all over India, where as in 2008 there was a decline 2% of these are of below 18 age group, 61% between 18-30, 32% between 30-45, 4% between 45-60 and 1% above 60 age group respectively.
2. Total Persons Arrested under IPC Sections for Cyber all over India during 2013 was 1203. 37% from 18-30, 50% from 30-45, 12% from 45-60 and 1% above 60 age group while during 2008, 195 persons arrested under IPC section. Out of these 1%, 31%, 57%, 11% are <18, 18-30, 30-45, 45-60 age group respectively.

5 References

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