Privacy Perceptions in India and US: A Mental Model Study

Ponnurangam Kumaraguru [†], Lorrie Faith Cranor [†] and Elaine Newton [‡]

[†]School of Computer Science, Carnegie Mellon University,
Pittsburgh, Pennsylvania 15213,
Email: {ponguru, lorrie+}@cs.cmu.edu
[‡]Engineering and Public Policy, Carnegie Mellon University,
Pittsburgh, Pennsylvania 15213
Email: enewton@andrew.cmu.edu

Abstract

DIRECTIONS - REFERENCES WHICH ARE BOLD ARE REFERENCES WHICH NEED TO BE CHECKED / VERIFIED. DETAILS REGARDING US DATA HAS TO BE FILLED IN TABLE 2. ALSO SOME DETAILS PROVIDED HERE MIGHT NOT BE ACTUALLY PRESENTED IN THE FINAL PAPER. *This abstract is same as what we submitted as Abstract to TPRC. If needed we need to modify it.*

As members of the educated population in India are increasingly using the Internet, adopting new technologies such as camera phones, and acquiring credit cards, Indians are increasingly becoming exposed to many of the same privacy risks that have raised concerns in other parts of the world. Although some have interpreted the Indian constitution and some Indian laws as providing some privacy protections, there are no Indian laws that explicitly address data privacy. However, with the recent growth of the Indian business process outsourcing industry, there has been considerable interest in adopting laws that would provide legal safeguards for personal data handled by businesses.

While many privacy studies have been done in the United States, Europe, Canada, and Australia, little research has been done to investigate attitudes about privacy in India. We conducted an exploratory study to gain an initial understanding of perceptions about privacy among Indians. We conducted 29 one-on-one "mental model" interviews that asked people 16 open-ended questions related to privacy. A mental model is the symbolic representation of an idea that an individual uses to interact with the real world and to represent social relationships. The questions were organized into several categories: general understanding of privacy and security, security and privacy of computerized data, knowledge of risks and protection against privacy risks, knowledge and awareness about laws regarding privacy, knowledge of data sharing and selling in organizations and government, and

1

demographics. Interviews were conducted in two states-Tamil Nadu and Andhra Pradesh. The average interview length was 35 minutes. All interviews were conducted in English; however, four interview subjects chose to answer some of the questions in Tamil. All interviews were recorded, transcribed (and the non-English parts translated), and coded.

We found that our respondents were largely unaware of how businesses and the government use their personal data. For example, most were unaware that businesses might keep records of their purchases, or that anyone might record data related to the use of swipe cards for building access. We also found that many respondents were unaware of the identity theft problem, and some who were aware of it were confident that it would not happen to them. While they did have some knowledge about email spam and other online privacy issues, most did not know how they could protect their privacy online. We also found people had a high level of trust that neither businesses nor the government would misuse their personal information.

Our interviews complement an earlier written privacy survey that we conducted in India and related studies conducted in the United States. This paper discusses the results of our Indian mental model study and compares our results with other studies.

1 Introduction / Background

While defining mental models [16] Introduction to Privacy [28], [3],
Privacy attitude studies - [17], [5], [29]
Trust behavior - [11], [12]
Survey collections - [9], [4], [30]
Mental model approach [21], [16]
Provide the list of cases relating to privacy - Delhi school MMS & Bazee Shahid & Kareena Kapoor Shakthi Kapoor India Today magazine.

Recently, news magazine India Today, featured a cover story titled Privacy on Sale, illustrated with a cover photo of a man with a bar code stamped on his head [5]. The Times of India featured a special report on The Death of Privacy [47]. Similar stories have been showing up in the Western press for several years, but have only recently appeared in India.

Paper Road Map

The remainder of this paper is organized as follows: In section 2, we present a general overview (discussing Law, Culture and Technology) of both the

countries - India and the US. In Section 3, we describe the methodology for our interviews both in India and in the US. We present the results of our analysis in Section 4 and discuss conclusions from the studies, limitations and future work in Section 5.

2   India and USA Today

India is the worlds second most populous country, with about 1 billion inhabitants and a population growth rate of 1.44% annually as of July 2004. India is a country where 70% of the population lives in rural villages and 60% of the population is involved in farming and agriculture [26], [27] (USE THE USA DETAILS TO PROVIDE SIMILAR VALUES). The Gross Domestic Product (GDP) per capita purchasing power parity of India is about $2,900 [26], [27] (PROVIDE VALUES FOR USA). New technologies that have brought with them increased privacy concerns in other parts of the world have been introduced more slowly in India than in Western countries. I AM TRYING TO GET ACCESS TO THE ITC DATABASE IN E&S LIBRARY WHICH CAN HELP IN FURTHER DETAILS, SINCE THEY HAVE THE 2003 VERSION OF THE DATABASE NOW.

2.1   Law

[19] provides the international privacy laws / acts.

[22] - provides information regarding India

[23] - provides information regarding USA

The Constitution of India, ratified in 1950, does not explicitly recognize the right to privacy [19]. However, the Supreme Court first recognized in 1964 that there is a right of privacy implicit in Article 21 of the Constitution, which states, No person shall be deprived of his life or personal liberty except according to procedure established by law [22]. Here there is no mention of the word privacy instead the term personal liberty has been used. There is no general data protection law in India. In May 2000, the government passed the Information Technology Act (IT Act 2000), a set of laws intended to pro-vide a comprehensive regulatory environment for electronic commerce. However the Act has no provision for protection of personal data [6]. It has been used to argue some privacy-related cases; however, its applicability is quite limited. For example, while the IT Act 2000 does not prohibit the use of hidden surveillance cameras, it does prohibit the electronic transmittal of obscene images, including those obtained through the use of hidden cameras. With the increasing use of cell phone cameras in In-

dian cities, the issue of video voyeurism has been gaining significant attention [14], [42]. In the last few years there have been discussions about creating privacy laws in In-dia. As more and more companies from other countries are conducting business in India, there is an increase in concern about the lack of privacy laws in India [44]. Proposals are being considered for a law that would mandate privacy protections for data from other countries that is handled by Indias outsourcing industry [41]. In the mean time, in response to recent incidents in which Indian outsourcing industry workers allegedly used personal information about customers of US companies to steal money from those customers, Indias National Association of Software and Service Companies (NASSCOM) announced in April 2005, that it has begun creating a data-base of all employees working in the outsourcing industry. Called Fortress India, this database will allow employers to screen out potential workers who have criminal records [8],[37].

India is planning for creating a self-regulatory [25], also reviewing the IT ACT [7]. Various incidents have caused problems for India in the International outsourcing market [13].

2.2   Culture

Indian culture may play a significant role in shaping attitudes about privacy. Cultural values are known to affect a populations attitudes about privacy [1], [2], [10], [24], [20]. Hofstede developed a number of cultural values indices to measure cultural differences between societies. According to Hofstede, India is a collectivist society with lower Individualism Index (IDV) and higher Power Distance Index (PDI) com-pared to the US, which is an individualist society with higher IDV and lower PDI. Hofstede has shown that individuals in collectivist societies have more trust and faith in other people than individuals in individualist societies [15], [14]. Anecdotal evidence of Indians tendency to trust that their personal information will not be misused can be found in recent Indian popular press reports that Indians are largely unaware of the extent to which databases of personal information are sold and traded among companies. When informed of this practice, the press reports that individuals are often shocked and outraged. Recently, news magazine India Today, featured a cover story titled Privacy on Sale, illustrated with a cover photo of a man with a bar code stamped on his head [5]. The Times of India featured a special report on The Death of Privacy [47]. Similar stories have been showing up in the Western press for several years, but have only recently appeared in India. The Indian joint family tradition [8], in which it is common for households to in-clude multiple brothers, their wives, and their children (all living in a relatively small house by US standards), results

4

in more routine sharing of personal information among a wider group of people than is typical in the US. Information that might typically be disclosed only to ones spouse or parents in the US is more frequently shared among uncles, aunts, and cousins in India. In addition, as it is common for Indian businesses to be owned and operated by large extended families, personal financial information is typically shared fairly widely among Indians.

2.3   Technology

Computer users - ?
internet users - ??
mobile users - ?
IT - ACT - ??
Technology ACTS in the US - ??

3   Methodology

We conducted mental model interviews among subjects both in the US and in India. These interviews were conducted during same time period in both the countries and we also used the same protocol in conducting the interviews. In this section, we describe the methodology we used during our study.

3.1   Interviews

We conducted one-on-one interviews to gain insights into the mental models people hold about privacy [16], [18]. We recorded interviews with 29 subjects and produced text transcripts. The interviews contained 17 open ended questions organized in several categories: general understanding of privacy and security, security and privacy of computerized data, knowledge of risks and protection against privacy risks, knowledge of data sharing and selling in organizations and government, and demographics. No personal information (name, email address, etc.) that would re-identify any individual was collected. We also used randomly generated numbers to identify the subjects in our notes so that the privacy of the subjects can be completely maintained.

Subjects were recruited who were at least 23 years old, with at least a Bachelors degree, and at least 6 months work experience. The interviews were conduced in Chennai and Hyderabad, but many of the subjects were originally from other cities in India.

3.2 Demographics

Table 1 provides the demographical information of the subjects from both the countries. `Compare the data between two countries.` Sixty-two percent of the subjects were male and 38% were female. The subjects ranged in age from 23 to 65 (75% were in the 23-35 category and 25% were in the 36-65 category). The average work experience was nine years. Thirty-one per-cent of subjects had only a bachelors degree while others held graduate or professional degrees. Thirty-eight percent of subjects work in technical fields while 62% work in non-technical fields such as linguistics, accounting, and the arts.

4 Analysis

In this section, we present our analysis in the categories of *General understanding of privacy and security, security and privacy of computerized data, knowledge of risks and protection against privacy risks, knowledge and awareness about laws regarding privacy and knowledge of data sharing and selling in organizations and government* among both the countries.

4.1 Control of Information / General Understanding

Basic definition and topics relating to privacy are different. The behavior of the subjects were seen to be reverse in the following two characteristics - relating privacy to control of information, as in the definition by Westin [28] (India - 37%, US - 61%) while it was reverse in relating privacy to space (which could be work space, home) (India - 41%, US - 18%). This shows that subjects in India relate privacy more towards home and space while in the US they think it more as control of their personal information.

No mention of ID-theft when asked in general about privacy in India while about 25% of subjects mentioned about ID-theft in the US.
We also saw subjects (43%) in the US related privacy computers while only 17% related privacy to computers in India.
There was no mention about government or organizational surveys when asked about privacy in India, while about 30% of the subjects in the US related privacy to government or organizational surveys.
Another drastic difference that we found is no subjects in the US related privacy towards family information, but in India about 21% of the subjects related privacy to family information.

Table 1: Characteristics of the sample from both countries

Features	India N = 29 Percentage	USA N = 28 percentage
Age		
25 years and below	17.24	25.00
26-35 years	58.62	25.00
36-45 years	13.79	32.10
46-55 years	6.90	10.70
56-65 years	3.45	9.20
Sex		
Male	62.07	28.60
Female	37.93	71.40
Education		
High School Diploma	3.45	7.10
Bachelors	31.03	53.60
Masters	41.38	17.80
Professional degree	17.24	0.00
PhD	3.45	3.60
Associate Degree	3.45	14.30
Profession		
Technical	37.93	19.20
non-technical	62.07	80.80
Marital Status		
Married	51.72	28.57
Un-Married	48.28	71.43
Parental Status		
Yes	37.93	21.43
No	62.07	78.57

Almost all the subjects in the US (97%) had specific examples to specify while discussing any known or related experience with privacy violations. But, we found only 48% of the Indian subjects had some examples regarding privacy violations. (check if you can get some expressions and add - Few expressions from the Indian subjects). Here also we found that many subjects in the US (61%) described privacy as control of information while it was only 3% in India. This again very well relates to the Q.1. results that subjects in India did not refer to privacy as control of information. In the same ways subjects in the US also related privacy to financial information (61%) while it was only 10% in India. While relating to computer privacy, subjects in India felt having a password is fine and it should protect their files completely. One of the expression from an Indian subject is *if we have to keep something important we use password*. For the same question one of the US subject mentioned *People being able to monitor my behavior and my opinions, my beliefs.That really freaks me out.* This shows that the awareness about the privacy with respect to computerization of data is less in India while it is higher in the US. We suspect many reasons for the same, we thing technology or communication would be one of the important aspect for the awareness of compartmentalization of data. This can be seen from [17] also. In general in this question subjects in the US were more comfortable in discussing regarding computerization of data (in various forms - internet, email and databases), while we saw very less influence of these technologies in India. Relating privacy to personal and physical privacy.

4.2   Computerization of Data

Junk emails - Not feeling comfortable in having the data computerized - Almost all the subjects in the US (97%) had specific examples to specify while discussing any known or related experience with privacy violations. But, we found only 48% of the Indian subjects had some examples regarding privacy violations. (check if you can get some expressions and add - Few expressions from the Indian subjects). Here also we found that many subjects in the US (61%) described privacy as control of information while it was only 3% in India. This again very well relates to the Q.1. results that subjects in India did not refer to privacy as control of information. In the same ways subjects in the US also related privacy to financial information (61%) while it was only 10% in India. While relating to computer privacy, subjects in India felt having a password is fine and it should protect their files completely. One of the expression from an Indian subject is *if we have to keep something important we use password*. For the same question one of the US subject mentioned *People being able to monitor my behavior and my opinions, my*

beliefs.That really freaks me out. This shows that the awareness about the privacy with respect to computerization of data is less in India while it is higher in the US. We suspect many reasons for the same, we thing technology or communication would be one of the important aspect for the awareness of compartmentalization of data. This can be seen from [17] also. In general in this question subjects in the US were more comfortable in discussing regarding computerization of data (in various forms - internet, email and databases), while we saw very less influence of these technologies in India.

4.3   Trust level for Authorities, Organization and Government

Sharing and Selling of data - Different data types - provide the list - Organization - Government - Third party. We found that in India there were more data-types mentioned in the government section than in the business section, which shows that they understand that government has more details than the business organizations. Subjects in the US referred to the advantage cards, while there was no mention about such facilities / technology used in the market. Subjects in the US while discussing abusing they clearly mentioned about about SPAM mails (coupons, offers, etc). Workplace privacy was mentioned by many of the subjects, while specifying about other potential employers getting access to the personal information one subject in the US mentioned *they might violate their equal opportunity policies, by not hiring you, because you know, they see that you were buying alcohol on a regular basis, Regarding sharing of information subjects in the US were clear about the information like they said, 50% abuse for Social security while 70% abuse to age, zip code.* Few of the respondents in the US also mentioned 1% for the abuse but added to it that "although it's probably happening more than that" Regarding govt. *knowing information about the individual "Government, they know everything about me" was the reaction of one of the subject.*

Awareness about different Data-Types being shared with organizations, businesses and government. Provide the table withe different data types. We in table 2 provide the top 5 of the data-types described by the subjects while discussing the different data-types that business organizations and government know about them. From table 2 we can see that very few number of subjects described credit card number as a data-type which business or organizations which they interact would know.

We in table 3 provide the information regarding the trust level of the subjects towards business organizations and government.

9

Table 2: *Percentage of subjects describing the given data-type while asked for information that the organization or the government captures. {G=government, B=Business, %=percentage}*

India - B	%	US - B	%	India - G	%	US - G	%
Name	51.72			Address	55.17		
Address	51.72			Salary details	44.83		
gender	24.14			Name	37.93		
Phone Number	24.14			Family details	37.93		
Credit card number	17.24			Academic qualification	24.14		

Table 3: Trust level for Business Organizations and Government. *Values provided in the table are valid percentage*

	Business		Government	
Trust-Level	India	US	India	US
Highly Trusting	86	24	81	62
Somewhat Trusting	7	48	15	17
Untrusting	7	28	4	21

4.4 Awareness about Laws / Acts

- IT Act 2000 - BS - 799 - PATRIOT ACT - Use the results from Q.13.

4.5 Risk and Protection / ID - Theft

- Identity Theft - No knowledge of protecting the data - discuss about results from Q.9.

4.6 Ignorance / Unaware of many topics

Topics which are not mentioned by the subjects in the discussion [e.g. shredding among Indian subjects, family privacy among US subjects.].

5 Discussion / Conclusion

Write about transport department in an organization sharing the information regarding the employees which could be accessed by any other organization. Telephone bills open cover (with all details), post office delivering at the door and anybody could get the cover and make use of it. This is treated as one of the proof of residence to obtain anything. - People are not convinced with the way the data is handled and some have taken actions to rectify the way in which the things are done but there have been no changes in the procedures. - Government trust but anecdotal references for people not having faith in the police force for respecting their privacy was seen. - Misusing of data - Organization - there is possibility but they will not be doing it. - When asked about laws for finding the reading habits, traveling information (Q - 13) most people have said why do we need laws "I don't see the need". - Find the number of people who say that information collected on them is not exclusively theirs. - Persons relating to RFID and types technology - People staying together (family - brothers, sisters, etc.) have disturbances sometimes in their house, but they don't feel that it is because of privacy that this problem is happening. - Most people specified that sharing medical information really do not play any crucial role in the current situation in India. - Most people have said "we don't have things like in the US" (E.g. tracking people, social security concept) - Passwords are shared and commonly kept in a location which can be accessed by many people. ("we never felt that there is any need to contain those information, need to remove accessibility to someone, etc."). - Some people have shown concerns about sections of minorities (like information regarding a group could be misused by government when changed) - Many have confidently said "I have never

felt a threat to my identity". - Shredders not at all referred or do not have the concept of shredding of the documents. - No body brought the thought of insiders creating problems regarding steeling of information etc. - Many people interviewed were from financial department or related department so they were concerned more about the data regarding salary etc. - Use page 4 from the Karat.doc data regarding survey and then an interview - perspective in obtaining ideas from the users - Identity theft an unknown concept in India - Awareness related to various data types - - No subject mentions about any of the following when asked to define or specify about privacy:..ID theft..Computer..Phone..Employer related issues ..Surveys ..Government related ... General understanding of privacy and security Security and privacy of computerized data Knowledge of risks and protection against privacy risks Knowledge and awareness about laws regarding privacy Knowledge of data sharing and selling in organizations and government

Acknowledgements

References

[1] BELLMAN, S., JOHNSON, E. J., KOBRIN, S. J., AND LOHSE, G. L. International Differences in Information privacy concerns: A global survey of consumers. *The Information Society. 20* (2004), 313 324.

[2] BONI, M. D., AND PRIGMORE, M. Cultural Aspects of Internet Privacy. In *Proceedings of the UKAIS 2002 Conference.* (2002).

[3] CAVOUKIAN, A., AND HAMILTON, T. *The Privacy Payoff, How Successful Business Build Consumer Trust.* McGraw-Hill Ryerson Trade., 2002.

[4] CLARKE, R. Reference List: Surveys of Privacy Attitudes. Retrieved June 18, 2005, http://www.anu.edu.au/people/Roger.Clarke/DV/Surveys.html.

[5] CRANOR, L. F., REAGLE, J., AND ACKERMAN, M. S. Beyond Concern: Understanding Net Users' Attitudes About Online Privacy. Tech. rep., Retrieved June 18, 2005, http://www.research.att.com/resources/trs/TRs/99/99.4/99.4.3/report.htm., September 25-27, 1999.

[6] DEPARTMENT OF INFORMATION TECHNOLOGY. Information Technology Act 2000. Retrieved Nov 10, 2004., http://www.mit.gov.in/it-bill.asp.

[7] ECONOMICTIMES. IT Act Review Panel to submit report. Retrieved June 28, 2005, http://economictimes.indiatimes.com/articleshow/1152691.cms.

[8] ENCYCLOPEDIA BRITANNICA ONLINE. The joint family. Retrieved Aug 4, 2005., http://www.britannica.com/eb/article?tocId=26070.

[9] ENTERPRISE PRIVACY INFORMATION CENTRE. Public Opinion on Privacy. Retrieved June 18, 2005, http://www.epic.org/privacy/survey/default.html.

[10] FJETLAND, M. Global Commerce and The privacy clash.. *The Information Management Journal.* (January/February 2002.).

[11] HARRIS INTERACTIVE FOR THE PRIVACY LEADERSHIP INITIATIVE (PLI). A survey of consumer pri-vacy attitudes and behavior. Tech. rep., 2001.

[12] HARRIS INTERACTIVE FOR THE PRIVACY LEADERSHIP INITIATIVE (PLI). Consumer Privacy Attitudes and Behaviors Survey - Wave II. Tech. rep., July 2001.

[13] HARVEY, O., AND REPORTER, S. O. Your life for sale. Retrieved June 28, 2005, http://www.thesun.co.uk/article/0,,2-2005280724,,00.html.

[14] HOFSTEDE, G. *Cultural and Organizations - Software of the Mind - Intercultural Cooperation and its importance for survival.* McGraw-Hill., 1991.

[15] HOFSTEDE., G. Geert Hofstede Analysis. Retrieved Oct 2, 2004., http://www.cyborlink.com/besite/hofstede.htm.

[16] JOHNSON-LAIRD, P. *Mental Models.* Cambridge, MA: Harvard University Press, 1983.

[17] KUMARAGURU, P., AND CRANOR, L. Privacy in India: Attitudes and Awareness. In *In Proceedings of the 2005 Workshop on Privacy Enhancing Technologies (PET2005)* (30 May - 1 June 2005), Lecture Notes in Computer Science. Springer Verlag.

[18] MEAD, G. H. *Mind, Self and Society.* University of Chicago Press., 1962.

[19] MICHAEL., H. *International Privacy, Publicity and Personality Laws.* Reed Elsevier., 2001.

[20] MILBERG, S. J., BURKE, S. J., SMITH, H. J., AND KALLMAN, E. A. Values, personal information privacy, and regulatory approaches. *Commun. ACM 38*, 12 (1995), 65–74.

[21] MORGAN, M. G., FISCHHOFF, B., BOSTROM, A., AND ATMAN, C. J. *Risk Communication : A Mental Models Approach.* Cambridge University Press, July 30, 2001.

[22] PRIVACY INTERNATIONAL. Republic of India. Retrieved Aug 4, 2005., http://www.privacyinternational.org/article.shtml?cmd[347]=x-347-83769.

[23] PRIVACY INTERNATIONAL. Republic of India. Retrieved Aug 4, 2005., http://www.privacyinternational.org/article.shtml?cmd[347]=x-347-83512.

[24] SANDRA J MILBERG, ET AL. Information privacy: Corporate management and national regulation. *Organizational Science, 2000 INFORMS 11*, 1 (January-February 2000.), 35 – 57.

[25] SILICONINDIA. BPOs soon to have self-regulatory body. Retrieved July 31, 2005,http://www.siliconindia.com/shownewsdata.asp?newsno=28782 &newscat=Technology.

[26] THE WORLD FACT BOOK. India. Retrieved Nov 25, 2004., http://www.cia.gov/cia/publications/factbook/geos/in.html.

[27] THE WORLD FACT BOOK. United States. Retrieved Aug 4, 2005., http://www.cia.gov/cia/publications/factbook/geos/us.html.

[28] WESTIN, A. *Privacy and Freedom.* Bodley Head., 1970.

[29] WESTIN, A., AND INTERACTIVE, H. The Equifax Canada Report on Consumers and Privacy in the Informa-tion Age. Tech. rep., 1992.

[30] WESTIN, A., AND THE STAFF OF THE CENTER FOR SOCIAL & LEGAL RESEARCH. Bibliography of Surveys of the U.S. Public, 1970-2003. Retrieved June 19, 2005, http://www.privacyexchange.org/iss/surveys/surveybibliography603.pdf.