

Privacy Perceptions in India and the United States: An Interview 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. Periodic privacy studies are conducted in the United States; however, very little information is available about privacy in India. As US companies are major clients of Indian outsourcing businesses, US businesses must rely on Indian companies to protect their personal information. To understand the privacy perceptions, awareness and concerns among people in India and in the US, we conducted an exploratory study in summer 2004. We used the “mental model” approach to conduct and analyze one-on-one interviews with 57 subjects in the US and India. Our analysis suggests that Indians and Americans have differing views or different levels of concern about privacy, and that Americans are more aware of privacy issues raised by new technologies.

1 Introduction

Privacy studies have been conducted across the world to understand privacy perceptions and concerns [2]. In particular there have been many studies conducted in the US [39], but very little information has been published about privacy perceptions and concerns in India. The Business Process Outsourcing (BPO) industry and the software industry in India are experiencing the need for privacy studies because of outsourcing of personal information to India from other countries. The Indian BPO industry currently employs over 900,000 people and is expected to employ 2 million people by 2008 [13].

The US is one of the largest clients of the BPO industry in India. Therefore, we wanted to understand the differences and similarities in privacy perceptions between India and the US. There are many aspects of privacy (personal privacy, information privacy and territorial privacy) described in the literature and we wanted to understand the awareness and concerns about these aspects of privacy in both countries [28].

We conducted an exploratory study to gain an initial understanding of privacy perceptions among Indians and Americans. In this study, we carried out one-on-one open-ended mental model interviews to gain insights into peoples' privacy perceptions. 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 [21], [23]. Preferences and choices made by people are influenced by their mental models. We used the interviews to compare the perceptions and behavior with respect to privacy among the subjects in India and in the US. This study was performed using the same protocol during summer 2004 in both countries.

The remainder of this paper is organized as follows: In Section 2, we present a general overview of law and culture in India and in the US. In Section 3, we describe the methodology for our interviews. We present the results of our analysis in Section 4 and discuss conclusions from this study, limitations and future work in Section 5.

2 India and the United States Today

India is the world's second most populous country, with about 1 billion inhabitants and a population growth rate of 1.4% annually as of July 2005. The United States is the world's third most populous country, with 200 million inhabitants and a population growth rate of 0.92% annually as of July 2005. The Gross Domestic Product (GDP) per capita purchasing power parity of India is about \$2,900 and the US is about \$40,100 as of July 2005 [6], [34], [35]. Table 1 provides the usage of various technologies per 100 inhabitants in both the countries [19], [20]. We can see from Table 1 that technology penetration in India has lagged significantly behind the US.

Table 1: Technology penetration per 100 inhabitants as of July 2005 [20]

Technology	India	US
Land line telephone lines	3.95	65.88
Mobile telephone lines	1.22	47.00
Internet	1.74	55.13
Personal computers	0.72	65.98

2.1 Regulatory Environment

Neither the Indian nor the US constitution explicitly recognizes the right to privacy. In India, in the *Kharak Singh vs State of Uttar Pradesh* [8] and *Gobind v State of Madhya Pradesh* [24] cases the Supreme Court recognized a right to privacy derived from constitutional rights to speech, to personal liberty, and to move freely within the country. This right was not viewed as an absolute right to privacy, nor did it address information privacy. The US constitution also does not provide any explicit right to privacy [24], but provides a *zone of privacy* recognized in its *penumbras* – emanations from the case law surrounding the bill of rights that provide guidance on its meaning. For example, the First Amendment provides a right of association and the Fourth Amendment prohibits unreasonable search and seizure, both of which relate to aspects of privacy [30].

There is no general data protection law in India, while several data protection laws exist in the US. In May 2000, the Indian government passed the Information Technology Act (IT Act 2000), a set of laws intended to provide a comprehensive regulatory environment for electronic commerce. However, the Act has no provision for protection of personal data [10]. On the other hand, in the US some sector specific privacy laws exist for protecting children’s online privacy [7], student education records [38], private financial information [29] and individuals’ medical record [5].

In both countries self-regulatory efforts are helping to define a better privacy environment. Due to incidences in India where employees of BPO organizations misused the personal information of the customers [16], [36], India’s National Association of Software and Service Companies (NASSCOM) is creating a database called “Fortress India.” In an attempt to reduce incidents of employees misusing personal information of customers, this database will

allow employers to screen out potential workers who have criminal records [4], [22]. NASSCOM is also involved in the review panel for modifying the IT ACT 2000 [11]. In the US, the Federal Trade Commission (FTC) has been pushing industry groups to adopt self-regulatory privacy measures and abide by a set of privacy guidelines [14]. Several privacy seal programs have been developed by industry groups [9].

2.2 Culture

Cultural values are known to affect a population's attitudes towards privacy [1], [3], [15], [25], [31]. Indian culture favors joint family living, where many relatives (brothers, their wives and their children) stay together in a single house [12]. The average number of people per Indian household is 5 while the average number of people per American household is 2.8 [33].

Hofstede developed a number of cultural values indices to measure cultural differences between societies. For example, the Individualism Index (IDV) measures the extent to which a society tends to emphasize individual rights versus collective goals. India is an example of a society with a low IDV ranking, tending to emphasize close personal relationships and supportive extended families. The US is an example of a society with a high IDV ranking, tending to emphasize individuality and loose personal relationships. Hofstede reported that individuals in collectivist societies have more trust and faith in other people than individuals in individualist societies [17], [18]. Thus we would expect Indians to be more trusting than Americans and, in particular, to trust the people and organizations to which they provide personal information.

3 Methodology

We conducted interviews with subjects in India and in the US. Our interview methodology is based loosely on the mental models method that is used in creating risk communications [26]. In this section, we describe our methodology.

3.1 Interviews

We conducted one-on-one open-ended interviews in India and in the US to gain insights into people’s views regarding privacy. In India, the interviews were conducted in Chennai and Hyderabad. In the US, the interviews were conducted in Pittsburgh. Subjects were recruited who were between 19 and 65 years old. We interviewed 29 subjects in India and 28 subjects in the US. We recorded interviews with the subjects and produced text transcripts.

3.2 Questionnaire

We used a protocol designed by Granger Morgan and Elaine Newton to provide insights into perceptions about privacy among the subjects in the US and in India. The protocol was designed to understand awareness and concerns about privacy, especially as they relate to technology and the law. The protocol contained 14 open ended questions and three questions about demographics and Internet usage. The 14 open ended questions covered the following five topics:

1. General understanding and concerns about privacy
2. Awareness of and concerns about privacy and technology
3. Concerns about identity theft
4. Knowledge of and need for privacy laws
5. Knowledge of data collection in organizations and government

Appendix A provides the complete protocol used for the interviews. No personal information (name, email address, etc.) that would re-identify any subject was recorded with the interview data. We used randomly generated numbers to identify the subjects in our notes so as to maintain subjects’ privacy.

3.3 Demographics

Our samples in India and in the US are not statistically representative of any particular community or of technology users. Table 2 summarizes the demographic information of the subjects from both the countries. Subjects

in both countries were statistically similar with respect to usage of e-mail and the web. Subjects in both the countries were mostly college educated and experienced Internet users. As the table shows, the demographic profiles of our subjects varied somewhat across the two countries. Therefore, we cannot rule out the possibility that some of the differences we observed across the two countries may be attributable to differences in gender, age, or education of our subjects.

4 Analysis

In this section, we compare the data collected in India and in the US. We present our analysis of general understanding and concerns about privacy; awareness of and concerns about privacy and technology; concerns about identity theft; knowledge of and need for privacy laws; and knowledge of data collection in organizations and government.

4.1 General Understanding and Concerns about Privacy

Subjects in both countries described many concepts when asked about what comes to mind when they hear the word *privacy*. Overall, the subjects in India discussed privacy in terms of personal space and subjects in the US related privacy to information privacy. While 61%¹ of the subjects in the US related privacy to some form of control of information only 14% of the subjects in India related privacy to these concepts. On the other hand, 48% of the subjects in India related privacy to physical, home and living space, but only 18% of the subjects in the US related privacy to these concepts. In addition, 50% of the US subjects mentioned either financial information or identity theft or both, while these concepts were not discussed by any of the Indian subjects. Typical responses of Indian subjects were: “Privacy for me is my personal territory” and “personal privacy.” A typical response from a US subject was: “[Privacy is] not allowing other people to have your information. It is protection of your information from outside people.”

¹Throughout this paper we report our results as valid percentages. Valid percent is the percentage calculated after removing those interviewees’ information that had missing or no response for the particular code.

Table 2: Demographics of subjects from both countries

Features	India	US
	N = 29	N = 28
Age		
25 years and below	17 %	25 %
26-35 years	59 %	25 %
36-45 years	14 %	32 %
46-55 years	7 %	11 %
56-65 years	3 %	7 %
Gender		
Male	62 %	29 %
Female	38 %	71 %
Education		
High School Diploma	3 %	7 %
Bachelors	31 %	54 %
Graduate or in pursuit of Graduate degree	42 %	21 %
Professional degree	18 %	0 %
Associate degree or in pursuit of Associate degree	3 %	14 %
PhD.	3 %	4 %
Education Type		
Technical	38 %	19 %
non-technical	62 %	81 %
Email usage		
Frequent	14 %	18 %
Once a day	72 %	79 %
Less than once a day	7 %	3 %
Never	7 %	0 %
Web surfing		
Frequent	7 %	8 %
Once a day	72 %	69 %
Less than once a day	14 %	23 %
Never	7 %	0 %

After the initial question about what comes to mind when they hear the word privacy, we asked the subjects who had not mentioned any specific privacy concerns if they had other general concerns about privacy. While none of the Indian subjects articulated any concerns in response to this question, 40% of the US subjects mentioned at least one specific concern. For example, one of the US subjects said, “I am concerned with the numbers - credit card numbers, social security number, drivers license. Then personal history of mine, while I go for interviews.”

After the question about privacy concerns, we asked the subjects what they think about the argument “Data security and privacy are not really a problem because I have nothing to hide.” While, only 21% of the Indian subjects disagreed, 89% of the US subjects disagreed with the statement. One of the Indian subjects said, “. . . maybe it is true and I have never thought about data security and privacy.” A typical response from a US subject was: “I disagree, what I have to hide is my financial life.”

4.2 Awareness of and Concerns about Privacy and Technology

Generally, we found the subjects in the US were more aware of technology’s impact on privacy than the subjects in India. In response to the first question about the meaning of the word privacy, 17% of the Indian subjects mentioned computer related issues and 46% of the subjects in the US mentioned computer related issues. We also asked a specific question regarding concerns about keeping computerized information secure. 79% of the subjects in the US were concerned about keeping computerized information secure, while the concern level was 21% among Indian subjects. Many of the US subjects also articulated specific computer related concerns. For example, one of the subjects in the US was concerned about, “People being able to monitor my behavior and my opinions, my beliefs [through email and browsing habits]. That really freaks me out.” On the other hand, a typical Indian response was, “No I don’t have any concerns. In fact I feel like you should computerize everything.”

To understand the concerns regarding privacy related to technologies we asked a specific question about technologies that subjects think might pose a threat to their privacy. While 15 of the Indian subjects did not mention any technology related threats towards privacy, only four of the US subjects did

not mention any threats. Among the subjects who mentioned threats from technologies, about a quarter of the subjects in both countries mentioned threats from cell phones with cameras. This behavior of the subjects might be attributable to the various incidents related to video voyeurism in both countries. We found significant differences in perception of threats from biometrics and the Internet. While no Indian subject mentioned biometrics, four of the US subjects mentioned biometric privacy treats. One of the Indian subjects and 14 of the US subjects mentioned Internet privacy threats.

4.3 Concerns about Identity Theft

We observed large differences in concerns about identity theft between the subjects in India and in the US. While 25% of the US subjects mentioned identity theft prior to our questions about identity theft, none of the Indian subjects mentioned it. When we asked subjects specifically about concerns related to identity theft, 82% of the US subjects were concerned about identity theft, while only 21% of the Indian subjects were concerned about this issue. The typical responses of the subjects in India were “No absolutely not. I have never felt a threat to [my] identity.” and “No, nothing, I don’t have concerns about my identity being stolen.”

We asked subjects if they had done anything to reduce the risk of their identity being stolen. While 48% of the US subjects said they shred sensitive documents, none of the Indian subjects reported shredding documents or taking other protective measures.

4.4 Knowledge of and Need for Privacy Laws

Subjects in neither country have much awareness of privacy laws and the US subjects tend to think they have more privacy protection than they actually have. While 14% of the US subjects mentioned privacy laws in response to our general questions about privacy, none of the Indian subjects mentioned any privacy law. To investigate further, we described 12 scenarios and asked subjects whether they think there are laws relevant to each scenario (for complete list of scenarios refer to question 13 in Appendix A). We got replies among the Indian subjects only for the following scenarios: to use computer records and other methods to determine shopping habits, to determine reading habits, and to connect to peoples’ cell phones or computers and send them customized advertisements. Even though there is no national privacy

law in either country regarding any of these three scenarios, a large number of US subjects said they thought such laws exist, as shown in Table 3.

Table 3: Percentage of subject’s who believed a law existed for the scenario

Scenarios	India	US
To use computer records and other methods to determine shopping habits	13 %	43 %
To determine reading habits	19 %	40 %
To connect to peoples’ cell phones or computers and send them customized advertisements	18 %	56 %

To understand the need for privacy laws, we asked the subjects if they thought that there should be laws for each of the scenarios mentioned in question 13. We found differences in the perceptions towards the need for privacy laws. A common response of the Indian subjects regarding privacy laws for shopping habits and reading habits was “Why do you need laws for it?” In particular, regarding sending customized advertisement to cell phones and computers, one Indian subject said, “Oh that’s good. I am going through a shop they can give us information and I can buy products.” In contrast, a common response of the US subjects was “they should send me customized information only if I want.”

During our discussions of the scenarios, 89% of US subjects mentioned opt-in and opt-out options, while only 7% of the Indian subjects mentioned these concepts. US companies frequently provide these options to their customers, while Indian companies tend not to provide these options to customers. It is unclear whether the apparently lower level of awareness in India is partially responsible for fewer Indian than American organizations providing opt-in and opt-out options, or, whether the absence of these options is playing a role in limiting Indian awareness about these features.

4.5 Knowledge of Data Collection in Organizations and Government

Both Indian and American subjects had a general understanding of the types of data collected by organizations and governments. American subjects were typically able to come up with longer lists of data-types (as shown in Table 4) than the Indian subjects, sometimes including types of data that probably are not routinely collected by either organizations or governments, for example, “whom I slept with,” “girl friend’s name,” and “sleeping habits.”

Table 4: Average number of data types mentioned by each subject

Category	India	US
Organizations	3.1	6.4
Government	5.0	7.3

We also found differences in the concerns regarding the government tracking subjects’ personal information. In response to our general questions about privacy, 33% of the US subjects mentioned the PATRIOT ACT and raised concerns about the government tracking their personal information, while none of the Indian subjects mentioned any similar concerns.

5 Discussion

This study was an exploratory study designed to provide a preliminary understanding of the differences in privacy perceptions between Indians and Americans. Unlike many previous studies [2], in this study we used the same protocol and conducted interviews during the same time period in both countries. This enables us to do a direct comparison of the results.

Generally, we observed less awareness about privacy among Indians than among Americans. Subjects in the US had a more sophisticated understanding of privacy than Indian subjects. The subjects in India mostly related privacy to personal space and subjects in the US mostly related privacy to information privacy. Most of the US subjects related privacy to some form of control of information or data protection. On the other hand, Indian subjects related privacy to physical, home and living space. We also found

differences in the awareness of and concerns about privacy and technology. US Subjects were more concerned about computerization of data than the Indian subjects. Subjects in the US discussed specific privacy issues related to the computer and Internet privacy. This difference may be attributable to differences in the technology penetration in both countries. The high level of awareness about general privacy concerns in the US may also be attributed to frequent US media coverage of privacy issues.

The data revealed that the US subjects were more aware of identity theft and related protection measures than the Indian subjects. This difference may be attributable to differences in the frequency with which identity theft occurs and is publicly discussed in both countries. For example, for the period Jan 1, 2001 to Aug 31, 2005, we found 410 articles in The New York Times, 208 in the Pittsburgh Post-Gazette, and six articles in the Times of India that contains the word identity theft. Identity theft may be less of a problem in India than in the US due to the fact that there is less frequent use of credit cards and many retail shops do not yet computerize any data. As computers and credit cards are used more in India, identity theft may become more of any issue. In the US, Identity theft has studied and organizations are actively educating the public about protection measures.

Neither Indian nor US subjects have much awareness of privacy laws and the US subjects tend to think they have more privacy protection than they actually do. A Large number of the US subjects believed that laws regarding data protection existed.

We also found Americans concerned about organizations and government tracking individuals. This attitude among Americans may be attributable to the existence of the concept of “Big Brother.” Indian subjects were unaware of the concept of the government tracking them.

We expect our results to aid future researchers in studying privacy attitudes and cross-cultural attitudes about privacy both in India and in the US. We showed in this paper that there exists a basic difference in privacy perceptions among Indians and Americans. As the impact of US privacy laws an self-regulatory programs is studied [27], it is important to realize that such laws and programs might have very different effects if introduced in India.

Surveys and interview studies provide only limited help in understanding the exact behavior of the public [32]. Although we obtained some interesting results that are consistent with studies of Indian and American cultural values, it is important to recognize the limitations of our samples. The re-

sults we obtained cannot be generalized to the entire Indian or American population. We also understand that the level of privacy concern reported by respondents does not necessarily correspond to their actual behavior [37].

Future research might include a national level survey to understand the common privacy perceptions of the entire population in both the countries. The study also might attempt to analyze the specific reasons for the privacy behavior of the subjects mentioned in this paper. As privacy in India is becoming one of the essential parts of conducting BPO businesses with other countries, a study to understand BPO employees' awareness towards customer data protection in the work environment would also be helpful. Finally, a longitudinal study would be helpful for analyzing changes in awareness and attitudes over time.

Acknowledgements

This research was partially funded by Carnegie Mellon CyLab, an IBM Faculty Award and the MacArthur Foundation. We are grateful to Granger Morgan, Carnegie Mellon University for initiating and supporting the project and co-authoring the interview protocol that we used.

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), pp. 313 – 324.
- [2] BENNETT, C. J. How Do Public Attitudes on Privacy Vary Among Nations: A Comparative Analysis Of National Privacy Surveys. Retrieved Aug 9, 2005, <http://www.privacyexchange.org/iss/surveys/Codesum.html>.
- [3] BONI, M. D., AND PRIGMORE, M. Cultural Aspects of Internet Privacy. In *Proceedings of the UKAIS 2002 Conference*. (2002).
- [4] BUSINESS STANDARD. NASSCOM to set up employee database. Retrieved April 23, 2005, http://www.nasscom.org/artDisplay.asp?art_id=4247.
- [5] CENTER FOR MEDICARE & MEDICAID SERVICES. The Health Insurance Portability and Accountability Act of 1996 (HIPAA). Retrieved Aug 25, 2005, <http://www.cms.hhs.gov/hipaa/>.
- [6] CLASS BRAIN. World Population Ranking. Retrieved Aug 11, 2005, http://www.classbrain.com/art_cr/publish/world_population_rank.shtml.
- [7] COPPA. Children’s Online Privacy Protection Act of 1998. Retrieved June 24, 2005, <http://www.ftc.gov/ogc/coppa1.htm>.
- [8] COURTS INFORMATICS DIVISION. Supreme Court of India Judgement Information System. Retrieved Aug 22, 2005, <http://judis.nic.in/supremecourt/qrydisp.asp?tfnm=12220>.
- [9] CRANOR, L. F. *Web Privacy with P3P*. O’Reilly & Associates, Inc., Sebastopol, CA, USA, 2002.
- [10] DEPARTMENT OF INFORMATION TECHNOLOGY. Information Technology Act 2000. Retrieved Nov 10, 2004., <http://www.mit.gov.in/it-bill.asp>.

- [11] ECONOMICTIMES. IT Act Review Panel to submit report. Retrieved June 28, 2005, <http://economictimes.indiatimes.com/articleshow/1152691.cms>.
- [12] ENCYCLOPEDIA BRITANNICA ONLINE. The joint family. Retrieved Aug 4, 2005., <http://www.britannica.com/eb/article?tocId=26070>.
- [13] FANNIN, R. India's Outsourcing Boom. Retrieved March 2004, Vol. 198, <http://www.chiefexecutive.net/depts/outsourcing/198.htm>.
- [14] FEDERAL TRADE COMMISSION. Privacy Online: A Report to Congress. Retrieved July 25, 2005, <http://www.ftc.gov/reports/privacy3/priv-23a.pdf>.
- [15] FJETLAND, M. Global Commerce and The privacy clash.. *The Information Management Journal*. (January/February 2002.).
- [16] 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>.
- [17] HOFSTEDE, G. *Cultural and Organizations - Software of the Mind - Intercultural Cooperation and its importance for survival*. McGraw-Hill., 1991.
- [18] HOFSTEDE., G. Geert Hofstede Analysis. Retrieved Oct 2, 2004., <http://www.cyborlink.com/besite/hofstede.htm>.
- [19] INTERNATIONAL TELECOMMUNICATION UNION. ICT Free Statistics. Retrieved Nov 10, 2004. <http://www.itu.int/ITU-D/ict/statistics/>.
- [20] INTERNATIONAL TELECOMMUNICATION UNION. World Telecommunication Indicators 2003. Used on Aug 5, 2005. * STARS Version 4.2.
- [21] JOHNSON-LAIRD, P. *Mental Models*. Cambridge, MA: Harvard University Press, 1983.
- [22] MARCELO, R., AND MERCHANT., K. Fortress India plan to combat online crime. Retrieved 23 April 2004, <http://news.ft.com/cms/s/ac5fb49a-abb9-11d9-893c-00000e2511c8.html>.

- [23] MEAD, G. H. *Mind, Self and Society*. University of Chicago Press., 1962.
- [24] MICHAEL., H. *International Privacy, Publicity and Personality Laws*. Reed Elsevier., 2001.
- [25] 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.
- [26] MORGAN, G. M., FISCHHOFF, B., BOSTROM, A., AND ATMAN., C. J. *Risk Communication: A Mental Models Approach*. Cambridge University Press., 2001.
- [27] NASSCOM - EVALUESERVE. NASSCOM - Evalueserve: Information Security Environment in India, 2004.
- [28] PRIVACY INTERNATIONAL. Privacy and Human Rights 2003: Overview. Retrieved Aug 9, 2005, <http://www.privacyinternational.org/survey/phr2003/overview.htm>.
- [29] PRIVACY OF CONSUMER FINANCIAL INFORMATION. The Gramm-Leach-Bliley Act. Retrieved June 24, 2005, <http://ftc.gov/privacy/glbact/glboutline.htm>.
- [30] ROBERT ELLIS SMITH. *Ben Franklin's web site : privacy and curiosity from Plymouth Rock to the internet*. Privacy Journal, 2000.
- [31] SANDRA J MILBERG, ET AL. Information privacy: Corporate management and national regulation. *Organizational Science*, 2000 *INFORMS* 11, 1 (January-February 2000.), 35 – 57.
- [32] SINGLETON, S. M., AND HARPER, J. With A Grain of Salt: What Consumer Privacy Surveys Don't Tell Us. Retrieved Nov 10, 2004. http://www.cei.org/PDFs/with_a_grain_of_salt.pdf.
- [33] TARGET GROUP INDEX GLOBAL. Household size. Retrieved Aug 11, 2005, [http://www.tgisurveys.com/news/Barometer/Barometer_Household Size.htm..](http://www.tgisurveys.com/news/Barometer/Barometer_Household_Size.htm..)

- [34] THE WORLD FACT BOOK. India. Retrieved Nov 25, 2004., <http://www.cia.gov/cia/publications/factbook/geos/in.html>.
- [35] THE WORLD FACT BOOK. United States. Retrieved Aug 4, 2005., <http://www.cia.gov/cia/publications/factbook/geos/us.html>.
- [36] TIMES NEWS NETWORK. BPO's do it again: Aussie data on sale. Retrieved Aug 17, 2005, <http://timesofindia.indiatimes.com/articleshow/1201198.cms>.
- [37] TURNER, C., AND MARTIN, E. *Surveying Subjective Phenomena*. New York: Russell Sage Foundation., 1984.
- [38] U.S. GOVERNMENT. Family Educational Rights and Privacy Act (FERPA). Retrieved Aug 5, 2005, <http://www.deltabravo.net/custody/ferpa.htm>.
- [39] 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>.

A Appendix - Questionnaire

Protocol for mental model interviews

Thanks for agreeing to talk with me. This interview is part of research I am doing at Carnegie Mellon University, USA. When we finish the interview I'd be happy to tell you about my research if you have questions.

The point of the interview is to learn how people think about several issues. There are no right or wrong answers.

1. When you hear the word privacy, what comes to your mind?

Prompts:

- (a) Anything else?
- (b) Any other thoughts about the word privacy?

2. Do you have any (other) concerns about privacy? If so, please tell me about them. I'm not asking you tell me about any specific private information, just about the general kinds of concerns you may have.
3. Keeping computerized information secure, and out of the hands of people and groups that should not have it, is a problem that overlaps the issue of privacy. Tell me about any concerns you may have about computer data security.

Prompts:

- (a) Anything else?
- (b) You said _____, tell me more about that.

4. People sometimes say: "Data security and privacy are not really a problem because I have nothing to hide." Please tell me what you think of that argument?

Prompts:

- (a) Anything else?
- (b) You said _____, tell me more about that.

5. Do you feel that information about you is exclusively yours and those who you allow to collect it?

6. Are you concerned about ‘authorities’ misusing personal data of yours or members of your family?

Prompts:

- (a) Anything else?
- (b) You said -----, tell me more about that.

7. Are you concerned about the government misusing personal data of particular groups or sectors of our society?

Prompts:

- (a) Anything else?
- (b) You said -----, tell me more about that.

8. Do you feel that more information collected on you and others will increase domestic or national security? Does it make you feel safer?

As appropriate follow this up with a series of prompts of the form:

- (a) You said -----, tell me more about that.

9. Are you concerned about identity theft? If so, how large is your concern? Have you done anything to reduce the risk of your identity being stolen?

As appropriate follow this up with a series of prompts of the form:

- (a) You said -----, tell me more about that.
- (b) If not explicitly mentioned:
 - i. shredder? (*Only option asked in India*)
 - ii. Do you do anything to take precautions online?
 - iii. Pop-up windows or gold/yellow lock?
 - iv. Check credit reports how often?
 - v. Know a victim of ID theft? Did it change your behaviors?

10. Consider technologies that exist today, or that soon might be developed. Are there some that you think pose a threat to privacy or data security? What potential harms concern you about those technologies?

As appropriate follow this up with a series of prompts of the form:

- (a) You said -----, tell me more about that.

11. Do you use e-mail? If so, how often?
12. Do you 'surf' the web? If so, how often?
13. Now I am going to read you a list of a dozen things and in each case get you to tell me if you think they are possible today. If you think they aren't possible today, tell me if you think they may become possible in the near future.
 - (a) Use computers records and other methods to determine your shopping habits. Is that possible?
Prompts:
 - i. Do you think there are laws about doing this?
 - ii. Do you think there should be laws about doing this? If so, what should they be?
 - (b) Determine what you like to read. Is that possible?
Prompts:
 - i. Do you think there are laws about doing this?
 - ii. Do you think there should be laws about doing this? If so, what should they be?
 - (c) Determine every time you go on a trip and figure out where you go. Is that possible?
Prompts:
 - i. Do you think there are laws about doing this?
 - ii. Do you think there should be laws about doing this? If so, what should they be?
 - (d) Locate where your cell phone is whenever you have it turned on. Is that possible?
Prompts:
 - i. Do you think there are laws about doing this?
 - ii. Do you think there should be laws about doing this? If so, what should they be?
 - (e) Identify you by your voice or face or the way you walk? Is that possible?
Prompts:

- i. Do you think there are laws about doing this?
 - ii. Do you think there should be laws about doing this? If so, what should they be?
- (f) Monitor phone calls with a computer that can understand speech and tell what is being said. Is that possible?

Prompts:

- i. Do you think there are laws about doing this?
 - ii. Do you think there should be laws about doing this? If so, what should they be?
- (g) Locate your car / vehicle where ever it is. Is that possible?

Prompts:

- i. Do you think there are laws about doing this?
 - ii. Do you think there should be laws about doing this? If so, what should they be?
- (h) Determine how your car / vehicle is being driven, or has been driven, in terms of the speed, the places its been, who is driving, how well they are driving, who did what just before a accident, and other things like that. Is that possible?

Prompts:

- i. Do you think there are laws about doing this?
 - ii. Do you think there should be laws about doing this? If so, what should they be?
- (i) While driving, determine your mood by measuring your heart rate, pressure on the pedals, and grip on the steering wheel? Is that possible?

Prompts:

- i. Do you think there are laws about doing this?
 - ii. Do you think there should be laws about doing this? If so, what should they be?
- (j) Connect to peoples' cell phones or computers and send them customized advertisements as they walk or drive by a store using information on those individual's current situation and shopping habits. Is that possible?

Prompts:

- i. Do you think there are laws about doing this?
 - ii. Do you think there should be laws about doing this? If so, what should they be?
- (k) Is it possible for companies that provide people with internet access to keep copies of all the e-mails their customers send or receive, and all the web sites they visit?
 - i. Do you think they should be allowed to sell that information to other companies who want to use it for marketing?
 - ii. Do you think they should be allowed to make that information available to the police whenever the police get a warrant?
 - iii. Do you think they should be allowed to make that information available to the police or government officials whenever they ask to see it?
- (l) The police, or intelligence organizations, keep track of where everyone is all the time, what they are reading, what they're buying, and who they are meeting with. Is that possible?

Prompts:

- i. Do you think there are laws about doing this?
- ii. Do you think there should be laws about doing this? If so, what should they be?

14. Please think for a few minutes and select a store or a company from which you often buy things. Take a few minutes and tell me everything you think they know about you. I don't actually want the specific information - just the categories of information like your name, gender, address, and so on.

Write down a list of what they report without any prompting.

Then prompt:

- (a) Anything else?
- (b) Is there any other kind of information they may know about you?
 - Now tell me how you think they could abuse that information and how likely you think it is that they will do that.

Prompt:

(a) How would you express that quantitatively? One-tenth? One-third? Certain?

(b) Anything else?

- Consider the company selling that information to another organization such as a bank or insurance company or potential employer. Now tell me how you think they could abuse that information and how likely you think it is that they will do that.

Prompt:

(a) How would you express that quantitatively? One-tenth? One-third? Certain?

(b) Anything else?

- Now consider the Indian / US government, as a whole - all the different parts of it. Again take a few minutes and tell me everything you think they know about you - not the specific information, again just the categories of information like your name and so on.

Write down a list of what they report without any prompting.

Prompt:

(a) Anything else?

- Now tell me how you think that some part of the government could abuse that information and how likely you think it is that they will do that.

Prompt:

(a) How would you express that quantitatively? One-tenth? One-third? Certain?

(b) Anything else?

15. Please think ahead a few years. If technology continues to develop the way it is now, please tell me what additional things, if any, the company you told me about, and the Indian / US government, will be able to know about you.

16. This is my last interview question. I'd like to go back to an earlier topic/question. Now that you've had a chance to think more about your personal data and the issues of privacy and security, what privacy concerns do you have now, if any? Do you have more or less concerns as you did at the beginning of the interview?

17. We would like to collect some basic demographic information about you:

- Gender? - Male or Female
- Age range? - 23-25; 26-35; 36-45; 46-55; or 56-65
- Highest Degree Earned? - High School Diploma, Associates Degree, Bachelors, Masters, Professional Degree (e.g. JD or MD), or PhD
- (If college educated) Is your degree technical or non-technical?
- Which state and city in India do you originate from? (*asked only in India*)
- Years of work experience?
- Are you married?
- Are you a parent?

Thanks very much for all your help.