

## Privacy and pricing personal information

Jeevan Jaisingh<sup>a,\*</sup>, Jack Barron<sup>b</sup>, Shailendra Mehta<sup>b</sup>, Alok Chaturvedi<sup>b</sup>

<sup>a</sup> *HKUST, Clear Water Bay, Kowloon, Hong Kong*

<sup>b</sup> *Krannert Graduate School of Management, Purdue University, West Lafayette, IN 47906, USA*

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### Abstract

The issues we address here are – How should a firm (e.g. Internet service provider (ISP)) that is capable of collecting personal information (browsing information, purchase history, etc.) about consumers, price its service, given that consumers vary in their valuation for privacy, and also vary in terms of the value of their personal information to a third party (firms that need consumer information)? Should the firm have a blanket policy of never collecting, or a policy of always collecting and revealing information? Surprisingly we find that in some cases the collector of information may be no worse off in the asymmetric information case than in the full information case. The paper provides a justification for the strategy of some firms such as ISP's which never collect information and also for the strategy of other firms, like grocery stores that do. We also find that it is non-optimal for the firm to design contracts where the consumer can choose an intermediate level of privacy.

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### 1. Introduction

The technological developments that have made e-commerce possible have also enhanced the ability of companies to collect, store, transfer, and analyze vast amounts of data, from and about the consumers who visit their store on the World Wide Web [6].

“Data Collection is the dominant activity of commercial web sites. Nearly 92 percent of them

collect personal data from web users, which they can aggregate, sort and use.” – [11]

These developments have increased privacy concerns among consumers, especially online consumers. Privacy is defined as the moral claim of the individuals to be left alone and to control the flow of information about themselves [5]. The loss of privacy in the Internet context comes from the inherent disutility associated with firms collecting browsing behavior, or tracking websites visited. According to a Business Week/Harris poll [2], privacy is the number one consumer issue facing the Internet. Another poll by the Wall Street Journal [21] on what Americans feared most in the next millennium, concerns regarding privacy, rated highest.

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\* Corresponding author.

*E-mail addresses:* [jeevan@ust.hk](mailto:jeevan@ust.hk) (J. Jaisingh), [barron@mgmt.purdue.edu](mailto:barron@mgmt.purdue.edu) (J. Barron), [mehta@mgmt.purdue.edu](mailto:mehta@mgmt.purdue.edu) (S. Mehta), [alok@mgmt.purdue.edu](mailto:alok@mgmt.purdue.edu) (A. Chaturvedi).

The other side of the story is that personal information is a valuable asset to private and governmental institutions, which use it to reduce their costs of operation [10]. The increasing thirst for personal information, and innovations in targeting technique, have made targeted marketing the hottest form of marketing, growing at twice the rate of America's GNP. It has been suggested by several authors [10,14] that the personal information, required for targeted marketing, can be treated as a commodity, and that firms who require this information, would be ready to pay a price for it in an 'information market'. There are several examples of firms providing an incentive to consumers to reveal personal information. Software firms provide free versions of their software which are advertising-supported (commonly called adware<sup>1</sup>). Customers view personalized advertisements from marketers based on the information collected while using the adware. Advertising free version of the same software can be bought at a price. Catalina Marketing Corporation offers monetary incentives to induce consumers to provide personal information. For example, a person's zip code and preferred supermarket is worth \$40 of coupons, and a personal shopping card number garners free products [12,18]. Grocery stores offer discounts on goods purchased using grocery store cards. Consumers accept discounts, with the implicit assumption that information on purchases collected, will be collected, and then sold to third parties by the grocery store [3]. The third parties then target the consumers with one to one marketing, based on the consumer profiles formed using the purchase history.

This collection of information by firms is leading to increased privacy concerns among consumers. These concerns about privacy need to be addressed to enable the growth of E-commerce. A proper balance needs to be achieved between the consumers' concerns for privacy and the needs of firms for personal information. This paper seeks to address the sharp increase in public debate about privacy issues, particularly on the issues of Internet privacy and the value of personal information.

In this paper the problem that we model is that of a collector of information (Internet service provider (ISP), adware seller, grocery store, etc.). It is technically feasible for the collector to track consumer

behavior – browsing profiles in case of the ISP and purchasing information in the case of the grocery store. If allowed to collect data, the collector can potentially build up a profile of the consumer, which may include but is not limited to information about preferences, income segment, etc. This information may be of great use to a third party who wants to target the consumers with a personalized product or service. By providing the third party access to this information, the collector enables the matching of the third party with the right consumers. This collection and release of consumer information, is what is termed as privacy violation in our context.

The research questions we are addressing here are – How should the collector of information price its service given that the consumers vary in their valuation for privacy and also vary in terms of the value of their personal information to the third party? Should the collector have a blanket policy of never collecting, or a policy of always collecting and revealing information? Is it better off providing its customers with a choice of several pricing options, each varying in the amount of information collected and revealed?

The results offer insights into when collection of information is optimal/non-optimal and provide a justification for the strategy of firms such as ISP's which never collect information, and other firms like grocery stores that do. Contrary to intuition, collection of information is not always optimal from the perspective of the firm collecting information. The environment that we have, is characterized by asymmetric information, where the consumers know their type while the collector and third parties do not know the type of the consumer. Surprisingly we find that in some cases the collector is no worse off than in the first best case, with no asymmetry of information. We also find that it is non-optimal for the firm to design contracts where the consumer can choose an intermediate level of privacy. Insights into conditions under which different pricing strategies are optimal are provided.

The rest of the paper is organized as follows: Section 2 covers the background literature on privacy. We specify our assumptions and the model framework in Section 3 – subsections look at the public, full and asymmetric information cases. We extend our basic framework in Section 4. Section 5 summarizes the results and the managerial implications. We also look at the limitations of our results and possible extensions.

<sup>1</sup> <http://en.wikipedia.org/wiki/Adware>.

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