

Reviews Manipulation and Online Commerce

-Extended Abstract-

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Motivation

The diffusion of broadband access to the Internet since the past 15 years has dramatically changed many aspects of business and market activities. A continuously growing proportion of economic activities shifts from brick-and-mortar institutions to electronic marketplaces.

On the one hand, the Internet's diffusion is responsible for the multiplication of information sources, the diminution in search costs and has given consumers the opportunity to make better and less costly decisions. We might believe that the Internet has increased welfare by improving the match between preferences and the goods that consumers buy. On the other hand, because the amount of information available is overwhelming and the number of online sellers grows at a steady rate, it might be difficult for consumers to identify where to obtain their information, which information is relevant to their decision-making and ultimately where and what to buy. As a direct consequence, the use of consumers generated content and product reviews has taken an enormous importance in online commerce. Consumers turn to these sites to obtain information on the products they want to buy and to choose among the variety of products that is available.

Gathering information from the experience of previous consumers seems close enough to the usual word-of-mouth process by which individuals obtain information from their families, friends, coworkers and so on. Yet, the anonymity that prevails on the Internet and the size of the market differentiate these two processes in a fundamental way. On the Internet, review manipulation by the sellers a very likely phenomenon. In fact, there are many examples where sellers have engaged in some activities related to the manipulation

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of online reviews. By writing excessively positive reviews for its own product or by offering discount to consumers to influence their review – these are two examples among many– a firm can influence in its favour the distribution of reviews available to the prospective buyers.

In this paper, I study the opportunity for manipulation of beliefs in the context of a monopoly. In particular, I address the long term effects of manipulation and the related issues of whether or not manipulation of reviews should constitute a real concern for the consumers. Using a dynamic model, I also investigate in which stage of the product life is it most profitable for the firm to manipulate the reviews.

Having an idea of the equilibrium firm's manipulation strategy and its welfare costs will help to decide whether or not resources need to be dedicated to identifying false reviews and if so, will allow computer science researchers to design optimal filtering algorithms to identify these false reviews.

The Idea

In the model, a firm introduces a new product on the market and lives for three periods: launching phase ($t = 0$), growing phase ($t = 1$) and maturity phase ($t = 2$). At each period, a continuum of consumers take a once-and-for-all decision to buy the good or not. There is an information asymmetry between the firm and the consumers: the firm knows the intrinsic quality of the good, the consumers don't. Hence the consumers would like to learn about the good's quality and they would do so from the experience of buyers from the previous periods. Specifically, after a consumer bought the good, he writes a review (noisy) reporting his experienced quality. Therefore at the end of each period, a set of buyers' reviews is available for the next generation of consumers. These consumers will use this set to update their beliefs on the good's quality.

In this setting, I am interested in the firm's incentives to manipulate the reviews. The opportunity for review manipulation lies in the fact that the higher the good's expected quality is, then the higher is the demand for the good and the higher are the profits. However, if the firm lives for more than one period, there is a tradeoff between the increase in profits and the distortion in the distribution of information for future buyers. Indeed, a higher demand and thus a higher number of buyers, implies that more reviews are written and available for the next generation of consumers.

In short, three general ideas form the basis of the analysis: i) consumers who have purchased the good have better information about its quality than those who have not and transmit that information, ii) the more consumers have purchased the good in the

past, the more the other consumers will become informed about the quality through online reviews, iii) the firm has better information about the quality of the good than consumers and through its choice of manipulation it controls the rate of information diffusion.

Results

1. I show that if the firm acts myopically, that is by maximizing the per-period profit without considering the impact on the distribution of information, the optimal manipulation strategy is a purely profit-diminishing activity. In this case, the firm continues to manipulate the reviews simply because the consumers expect her to do so.
2. The forward-looking firm that anticipates that manipulation will affect the informativeness of reviews for future generation of buyers, uses the manipulation of early reviews as a signaling device for quality. Indeed, I find that the optimal level of manipulation is increasing in the good's quality, i.e., higher quality firms manipulate more. Hence, contrarily to the common belief, manipulation might benefit the consumers by changing the reviews informativeness. In other words, even if some consumers are fooled by the false reviews, future buyers are better off as a result of the better information.
3. Finally, building on empirical evidence that shows that buyers with extremely positive/negative experience are more prone to write reviews, I investigate what are the impacts for the firm's optimal manipulation if a buyer's decision to leave feedback depends on his utility level. Results 1 and 2 might not remain true in the case where only a fraction of the buyers writes a review after purchase.