



Interfaces with Other Disciplines

Predicting online-purchasing behaviour

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Abstract

This empirical study investigates the contribution of different types of predictors to the purchasing behaviour at an online store. We use logit modelling to predict whether or not a purchase is made during the next visit to the website using both forward and backward variable-selection techniques, as well as Furnival and Wilson's global score search algorithm to find the *best subset* of predictors. We contribute to the literature by using variables from four different categories in predicting online-purchasing behaviour: (1) general clickstream behaviour at the level of the visit, (2) more detailed clickstream information, (3) customer demographics, and (4) historical purchase behaviour. The results show that predictors from all four categories are retained in the final (best subset) solution indicating that clickstream behaviour is important when determining the tendency to buy. We clearly indicate the contribution in predictive power of variables that were never used before in online purchasing studies. Detailed clickstream variables are the most important ones in classifying customers according to their online purchase behaviour. Though our dataset is limited in size, we are able to highlight the advantage of e-commerce retailers of being able to capture an elaborate list of customer information.

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1. Introduction

Since the advent of the Internet, the possibilities with regard to the distribution of goods and/or services have changed substantially. Firms are able to offer goods/services not only through traditional channels such as retail outlets, but also in an on-

line virtual store. But there is more to it than just the addition of a new channel of distribution.

First, whereas data captured from purchases in traditional stores only collect information concerning the *buying* behaviour of their clients, online data provides much more information (Moe and Fader, 2002). Clickstream data typically contain the trajectory of (prospective) clients at the company's website. Subsequently, also the visits that do not result in a purchase of one or more products/services are monitored that makes the customer picture, which firms are attempting to compose, more complete. Clickstreams offer the

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opportunity to thoroughly improve the understanding of customer activities being an important competitive advantage providing market research as a by-product (Andersen et al., 2000). Bucklin et al. (2002) conclude: “The detailed nature of the information tracked about Internet usage and e-commerce transactions presents an enormous opportunity for empirical modelers to enhance the understanding and prediction of choice behaviour”.

Secondly, the Internet makes it possible to outline better client relations (Bauer et al., 2002). Customer relationship management (CRM) goes hand in hand with personalization of customer treatments, i.e., alternative strategies can be pursued for different segments as e.g. outlined in Baesens et al. (2004). Through their website, companies can communicate individually with their current clients and prospects. As a result, products, services and even marketing actions can be adjusted to the profile of visitors in order to influence (potential) customers’ visiting and shopping behaviour. Finally, Moe and Fader (2001) argue that the more refined the segmentation or profiling of the customer base is, the more efficiently a profitable target segment can be identified.

However, being active in an e-business environment does not necessarily implicate a bed of all roses. Clients or visitors of e-commerce websites are rarely loyal to a specific website when searching for a particular product or category (Johnson et al., 2000). Moreover, the conversion rate, defined as the percentage of website visits that lead to a purchase, is very low (Bucklin et al., 2003). One of the reasons is that costs of visiting e-commerce sites are limited compared to the offline world and may result in a delay of purchases (Moe and Fader, 2002). Besides, competition is fierce and clients are able to compare the offers of several companies in an instant’s notice. Finally, buying online is not yet well-accepted behaviour and varies widely by product/service category (Van den Poel and Leunis, 1999). Sismeiro and Bucklin (2003) indicate that almost 75% of the Internet users browsed or searched for a specific product but 65% of the visitors never used the Internet to actually buy something. The Internet is most of the

time used as an information source (Van den Poel and Leunis, 1999).

Finally, a lot of research still needs to be done concerning Internet usage since Internet choice behaviour is in many respects substantially different from the behaviour that is already thoroughly explored in a traditional store-retail setting (Bucklin et al., 2002). Internet choice behaviour is more dynamic which provides modelers with more and different types of consumer choices. Besides, the intent of the visitor (browse, search or purchase) is not noticeable. Finally, the marketer has the opportunity to personalise the choice environment and respond in numerous ways at any moment in time. Consequently, other models are needed for understanding Internet behaviour and being able to make predictions about it.

In this study, we develop a model to predict whether a registered website user is going to purchase during the next visit. This enables us to derive individual purchase probabilities for each client in the customer database of an e-business website in order to know their future objective. The purpose is to differentiate customers based on as many as possible dimensions: past customer information concerning general clickstream behaviour and detailed clickstream measures, as well as historical purchase behaviour and customer demographics. To the best of our knowledge, no previous research incorporates variables from all of these categories in one and the same study. This is shown in Table 1, which will be discussed in Section 2.

In summary, we contribute to the existing literature in many respects: (1) We include a large list of predictors from different variable types into one and the same model. This offers the possibility to evaluate various predictor categories concerning their relevance for future purchase forecasts. (2) Since most of our proposed variables were never used before in other studies, we evaluate the gain in predictive power that can be attributed to their inclusion. Thanks to the numerous variables the variability in the model can be reduced so we are able to better classify customers concerning their future purchase behaviour on the Internet. In this process, different variable selection techniques are applied to identify the most important predictors

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