Chapter 71

Comparing Predictive Ability of Classifiers in Forecasting Online Buying Behaviour:
An Empirical Study

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ABSTRACT

With Internet invading geographic boundaries and diverse demographic strata, online shopping is growing at exponential rate. Expected to grow by 45 per cent to $7.69 billion by the end of 2015, India's ecommerce market has emerged as one of the most anticipated destinations for both multinational and domestic retailers. Since their success will depend on their ability to attract shoppers to buy online, it becomes relevant for them to decipher Indian consumers' attitude and behaviour towards online shopping and to predict online buying potential in India. The effectiveness of marketing and promotional strategies and action plans also will have to be pivoted around the potential available in the market. This empirical study explores the accuracy, precision and recall of four different classifying techniques used in predicting online buying. The forecasting ability of logistic regression (LR), artificial neural network (ANN), support vector machines (SVM) and random forest (RF) in the context of willingness of shoppers' to buy online has been compared. Analysis of the data supported most of the predictions albeit with varying level of accuracy. The outcome of the study reflects the superiority of artificial neural network over the other three models in terms of the predicting power. This paper adds to the knowledge body for online retailers in reducing their vulnerability with respect to market demand and improves their preparedness to handle the market response. Managerial implications of the findings and scope for future research have been deliberated.

INTRODUCTION

Radically changing the business models, E-commerce has significantly changed marketing communications and distribution systems, besides altering systems and processes in consumer services. Moving away from a mass marketing approach to a one to one relational paradigm, e-marketing has ushered interactions with consumers in real essence where their inputs are valued. Firms, now offer goods and services not only through traditional channels like company owned and/ or independent retail outlets, but also through online virtual stores. Besides adding a new channel of distribution, businesses are increasingly seeking to engage with their consumers through personalised interactions facilitated by this medium. Companies are assisting potential customers in identifying appropriate products or alternatively customising products to meet their requirements. In either case, faster firms are able to fulfil the requirements of their potential customers, more likely shall purchase happen. Hence, practically every major company with a retail operation has its own web site and online sales facilities, where web personalisation has become an essential element. The universal endeavour is to improve the customers' experience and encourage their loyalty.

On business side, global e-commerce sales touched $1.316 trillion in 2014 up 22.2% from $1.077 trillion in 2013 (eMarketer, 2014). It is further forecasted that this would rise to $1.592 trillion in 2015 representing 6.7% of sales. The same would increase to $2.489 trillion or 8.8% of sales by 2018. In the Indian context, this category of retail sale is expected to grow by 45 per cent to $7.69 billion by the end of 2015 (eMarketer, 2014).

However, being active in an e-business environment does not necessarily imply business results. Clients or visitors of e-commerce websites are rarely loyal to a specific website while searching for a particular product or category (Johnson et al., 2000). Also, the conversion rate, defined as the percentage of website visits that lead to a purchase, is very low (Bucklin et al., 2002). One of the reasons attributed here is cost involved in browsing. The cost of visiting e-commerce sites is very miniscule in comparison with that in an offline world. This usually results in a delay of purchases (Moe & Fader, 2002). The availability of information on a web augurs clients' ability to compare the offers of several competitors. Besides this, even buying online hasn't yet evolved as a well-accepted behaviour in many markets and varies widely with product/service category (Van den Poel & Leunis, 1999). Sismeiro and Bucklin (2004) indicated that almost three-fourth of internet users browsed or searched for a specific product, but nearly two-third of the visitors never used it to actually buy something. Most of the time it is used as information source (Van den Poel & Leunis, 1999). The intent of the visitors (browse, search or purchase) is not noticeable.

Internet choice behaviour is more dynamic that provides more and varied types of consumer choices. Marketers have the opportunity to personalise the choice environment and respond in numerous ways at any moment in time. Since, this choice behaviour, in many respects, is substantially different from the behaviour that is already thoroughly explored in a traditional store-retail setting (Bucklin et al., 2002), a lot of research is still needed to be undertaken concerning Internet usage. Consequently, other models are needed to understand Internet behaviour and make predictions about it.

Predictive modelling has gained an important role in marketing, as it helps managers to analyse customers' response and drive the decision process. The array of models being used for predictive analysis includes both statistical models and artificial intelligence based models such as neural networks. The objective of predictive models is typically to forecast a response measure for each customer, as a function of a host of independent variables (predictors). Most of the studies conducted in the context of online consumer behaviour have focussed on using structural equation modelling (SEM) for predicting online

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