

New product diffusion over a social network: The case of the iPhone

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Outline of proposed presentation for
2009 Symposium on Statistical Challenges in eCommerce Research
Carnegie Mellon University, May 30 and 31, 2009

In this paper I study the diffusion of the iPhone over a period of several months after its launch. In particular, I am interested in how adoption and diffusion processes are influenced by interactions between individuals. In other words, I am interested in studying how the social networks of consumers influence consumption decisions. The iPhone is arguably a prime case of pre-launch marketing “buzz” by its manufacturer and the mobile phone companies offering the iPhone with the goal to stimulate consumers to talk about the product and take it up. The iPhone is also a highly conspicuous product and it can therefore be expected that consumer’s influence each other in the adoption of this handset.

A large-scale study of the diffusion of a product over a social network and the interdependence between consumption decisions is only possible with electronically generated data, and the research benefits from unique access to customer data from a large European mobile phone carrier. The dataset contains (suitably anonymised and protected from unauthorised access) records of interactions between subscribers on this network. Using this data, it is possible to construct a network of interactions between subscribers. In addition, the dataset contains data on the brand and model of handset used by each subscriber.

Only recently, such data on social networks has become available in electronic format. Thus, the study of diffusion on large scale networks is now possible and this paper is a step towards making full use of these new opportunities. Areas of interest for eCommerce research and commercial applications are all technologies that leave a trail of electronic records from which network structures and flows can be deduced. This is for example the case for instant messaging (e.g. MSN, Skype), video messaging or social networking software (e.g. MySpace, Facebook). As these records are available in electronic format, they can be analysed in a highly automated fashion, which is of strong commercial interest to companies. The output helps companies to understand their customers better and to use this understanding to drive usage of existing products and introduction of new services. This paper builds on earlier work on demand and interactions between customers (Birke and Swann, 2006) and a paper on the interdependence of churn decisions presented at SCECR 2008 (Birke, 2008).

The econometric model used to analyse a consumer’s decision to adopt the iPhone takes account of individual characteristics of the consumer and the structure of his/her

social network. The influence of a particular consumer's social network is modelled by calculating variables summarising the adoption behaviour of those that interact with that particular consumer. A survival analysis model is used which is most suitable for *time-to-event* data, where different consumers adopt a product at different stages over a given time period. These models are common in the relevant literature (e.g. Saloner & Shepard, 1995).

There are three major challenges when working with such data. Firstly, data volumes are typically very large. In my case, millions of consumers and many more transactions between these consumers are observed. Secondly, the timing of adoption decisions is essential and is captured in a survival analysis framework. For each consumer the adoption date is known. Thirdly, as the model captures interactions between consumers, this interaction has to be captured appropriately by the statistical model.

The paper has two main objectives. The first is to determine whether social networks really are important for the study of mobile handset diffusion or whether this process is driven primarily by individual consumer characteristics. Empirical results indeed show that a consumer's social network plays a key part in the diffusion of the product and that product adoption is clustered both in social space and time. The second objective is to show how marketing activities can lead to viral diffusion of a new product. To this end, the mobile phone company conducted a marketing campaign aimed at a subset of their customer base. In this quasi-experimental set-up, the paper studies how this marketing activity influenced the adoption of the iPhone.

References

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