

Pre-launch Prediction of Market Performance for Short Lifecycle Products Using Online Community Data



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Abstract

Prediction of sales for short life-cycle products can be problematic. Generic predictive models based on past launches may provide only crude historic data which are unsuited for distinctive, innovative products. This paper investigates the role of online communities in providing pre-launch data to predict post-launch sales. We argue that levels of *awareness*, *word-of-mouth*, *expectations*, and *adoption intention* prevailing within an online community for an upcoming product have an independent *direct effect* on the product's future sales. Additionally, we test the *complementarity effect* of these *community variables* by introducing a higher order construct called *Pre-release Community Buzz*, to demonstrate the incremental explanatory power of using pre-launch community variables to predict post-launch sales. Data for community variables were collected from a movie-based online community, and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). We found strong support for both direct and complementarity effects of community variables in predicting a movie's opening week sales. We also found that community variables mediate the effects of generic predictor variables such as MPAA ratings, star cast, production budget and competition on opening week sales. Tests for robustness demonstrated the value of community variables. Models which included community variables had higher predictive power than those without. Implications for theory and practice are presented.

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Introduction

This paper addresses the problem of forecasting sales for short lifecycle products where opportunities for undertaking marketing research pre- and post-launch may be limited by the expected short lifecycle of the product and dynamic market environment in which new competing products can appear very quickly. In such a context, there is a great motivation for firms to obtain early, dynamic, and accurate pre-launch prediction of market demand to guide their product development and market entry processes. While several approaches for forecasting sales have been reported

in the literature, many of these are not suitable for short life cycle products (Chung, Niu, and Sriskandarajah 2012). Therefore, this study contributes to knowledge by developing a methodology to improve prelaunch prediction of market performance, specifically for short lifecycle products.

The use of social media in predicating demand has aroused considerable recent interest. This is consistent with the conceptual framework of Service Dominant Logic (SDL) which identifies as a firm's collaborative competence in the ability to bring customers and other stakeholders into the process of innovation (Lusch, Vargo, and O'Brien 2007). SDL defines customers as an operant resource (Vargo and Lusch 2004) and collaborating with them in developing and launching new products can tap into a valuable source of knowledge (Blazevic and Lievens 2008; Brown and Patterson 2009). It has been suggested that the use of customers as an operant resource can reduce the development time for new

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products, and this is particularly important for short lifecycle products (Alam 2002).

There is nothing new in the ability of customers and other stakeholders to contribute to firms' demand forecasting methods, even when customers have only limited information. Since Francis Galton's often cited experiment to invite members of the public to guess the weight of an ox, researchers have noted that in certain conditions, the "wisdom of crowds" can approximate to reliable predictions (Greenfield 2008). This apparent wisdom can be more efficiently and effectively captured in online environments, and in this paper we show how information posted unprompted by members of online communities about a forthcoming new product can be transformed into knowledge to inform and improve firms' predictions of demand for short lifecycle products. We do not suggest that Galton's philosophy can replace demand forecasting based on traditional metrics, but community generated data may provide additional and complementary insights to improve predictions of market performance.

We particularly focus on activities that occur *before* product launch. For short life cycle products, there may be insufficient time to undertake pre-launch test marketing, and the short product life which follows may not allow opportunities for further research and modification before the product's life is over and it is superseded by newer products. Obtaining data from multiple online opinion formers who discuss pre-launch announcements may provide valuable input to the pre-launch demand forecasting process.

In summary, the aim of this study is to investigate whether *pre-launch activities within online communities can improve predictions of post-launch sales for short lifecycle products*. We undertake our investigation in the context of movie releases.

This paper is organized as follows; the following section provides an overview of the existing theoretical perspectives on forecasting demand for innovative, short life cycle products with a specific focus on short lifecycle movies. This is followed by the development of hypotheses on the relationships between pre-release community variables and post-release sales performance. The research methodology then describes a largely quantitative approach, data collection and analysis procedures, followed by the analysis and discussion of the results. The final section provides conclusions, implications and limitations of this study.

Theoretical Background

Forecasting Short Lifecycle Products — General Issues

Forecasting demand for highly fashionable, short lifecycle goods and services is problematic. Past data may be of only limited relevance to the new product (Spann and Skiera 2003), and models used to predict sales, such as diffusion models based on the sales of analogous products (Bayus 1993), or simulations and conjoint analysis studies may make false assumptions about comparator bases for evaluation (Green and Srinivasan 1990). Test marketing can sometimes be used for forecasting demand, however, for short life cycle products, time available for this may be limited and furthermore, competitors

may also learn from the exercise (Hair, Bush, and Ortinau 2008). To exacerbate the problem, short lifecycle products typically realize the majority of sales in the first few weeks after launch, followed by quickly declining sales (Chung, Niu, and Sriskandarajah 2012), and since each product is unique and original, no reliable benchmarks can be used to predict sales of specific new products. The short lifecycle allows very little opportunity for post-launch data to be gathered, analyzed and to inform revised marketing activities during the remaining time available in the product's lifecycle.

Forecasting Short Lifecycle Products — the Specific Case of Movies

Movies are a very good example of a short lifecycle product. Box office receipts during the first two weeks following release of a movie typically account for 25% of total lifetime revenue (Litman and Ahn 1998). Predicting box office revenues before release is vital in order to optimize marketing activities, such as the release date, deciding the number of screens for the movie to be shown at, improving awareness through new trailers and advertisements, and negotiating contracts with cinema owners.

The difficulty and uncertainty in predicting a movie's box office revenues have challenged many researchers and industry experts. Unpredictability of demand and often very high production costs make the launch of new movies very risky. The experiential nature of movie consumption makes it difficult to judge movie quality before it is viewed (Liu 2006). Consumers often engage in word-of-mouth (WOM) to gather more information (Harrison-Walker 2001) and WOM can in turn influence demand through social norm (Bacile, Ye, and Swilley 2014).

In spite of such unpredictability, many models have been developed for predicting the financial success of movies (typically measured as total box-office revenues), but only AFTER a movie's release and not pre-release (Chintagunta, Gopinath, and Venkataraman 2010; Neelamegham and Chintagunta 1999). As the nearest, easily measured surrogate, researchers have used the first week's receipts to predict total revenues with high accuracy (Liu 2006; Sawhney and Eliashberg 1996).

Predictive models of a movie's success are typically based on a range of potentially quantifiable variables such as, production budget, advertising, awards, major stars and word-of-mouth, as predictors (Liu 2006; Marshall, Dockendorff, and Ibáñez 2013; e.g., Moon, Bergey, and Iacobucci 2010; Plucker et al. 2009; Zhu and Zhang 2010). However, these tend to be fairly crude generic models which do not adequately capture experiential aspects of a movie and the momentum given to sales by social approval. To supplement this, there has been increasing interest in the use of online discussions among movie enthusiasts to provide supplementary input to predictions of box office sales. For example, Liu (2006) used online conversations to measure the word-of-mouth effect and found that the volume of word-of-mouth (but not the valence) had significant explanatory power for predicting box office performance. Similarly, Moon, Berger, and Iacobucci (2010) showed how post-release online user ratings influenced a movie's future box office revenues. However, such research has

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