

Chapter 46

Virtual Stock Markets as a Research Tool in Marketing and Management

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ABSTRACT

Virtual Stock Markets (VSM) are a young, powerful and still evolving research tool. VSM were developed around 20 years ago as forecasting instrument of election outcomes, having delivered very precise results ever since. In recent years, various business applications of the given concept have been presented, namely forecast generation, decision support, product concept evaluation and the identification of lead users. This article explains the basic concept of VSM, describes the potential areas of application and shows examples of successful implementations in business practice. Directions for further research are identified.

INTRODUCTION

Virtual Stock Markets¹ (VSM) are still relatively unknown as a research tool in marketing and management (Surowiecki, 2005). Yet, the concept of VSM has received increased attention in recent years. The number of scientific publications, dealing with the given concept, has grown substantially over the last years (Tziralis & Tatsiopoulou, 2007). Most notably, the year of 2007 saw the introduction

of the *Journal of Prediction Markets*, an academic journal dedicated to this topic exclusively.

VSM can fulfill a number of purposes in marketing and management, ranging from relatively simple business forecasts to more complex tests of product concepts, decision support and the identification of lead users among traders. VSM are especially relevant in e-Business as they provide a means for companies to aggregate the knowledge and opinions of a very large number of participants from distant locations using electronic communication devices.

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BACKGROUND

VSM work similar to regular stock markets. However, the listed stocks do not represent the shares of companies but are tied to the outcomes of future events. Every stock has a fixed lifetime after which the actual outcome of the predicted event can be observed. The final value of the stock is determined accordingly. During the lifetime of the stock market, traders compare the current market prices with their individual expectations of the outcome and make trades accordingly. Supply and demand determine the prices of stocks.²

Following the logic of *Hayek hypothesis* (Hayek, 1945) and *information efficiency hypothesis* (Fama, 1970), the resulting market prices reflect the traders' aggregate expectations of the future events, which the stocks are tied to. According to Hayek (1945), this mechanism to aggregate information works efficiently even in the extreme case of all market participants holding diverging information.

The first application of VSM was the *Iowa Presidential Stock Market* (Forsythe et al., 1992). In this example, virtual stocks were traded representing the vote shares of the different candidates in the 1988 Presidential elections. Actual outcomes could be predicted very precisely. Forecasts based on VSM outperformed every pollster's forecast in terms of prediction accuracy and low fluctuation levels in forecasts prior to the election date. VSM have been able to repeat this remarkable performance in the subsequent implementations (e.g., Berg et al., 2008), sparking academics' interest and laying the basis for different applications in related fields, most importantly in business research and practice.

AREAS OF VSM DEPLOYMENT IN MARKETING AND MANAGEMENT

Forecast Generation

Companies can use VSM to predict a wide range of relevant problems. Market participants can

either be company insiders (e. g., sales employees predicting futures price levels in the market) or outsiders (e. g., customers predicting market shares for specific products).

VSM are especially useful when other forecasting techniques cannot be used, e.g. when data are inaccessible or influencing factors are complex (Berg et al., 2003; Hanson, 2006a). Also, VSM bypass the flaws of traditional research instruments in business. VSM results are not dependent on a representative sample. Traders usually enjoy participating and do not have to be offered large monetary incentives. Furthermore, the results are unbiased by social desirable behavior or researcher's influences because market participants act anonymously (Hanson, 2006b). VSM are a dynamic system, being able to incorporate new information quickly (Snowberg et al., 2007) and therefore make it possible to observe developments over time. Also, fluctuations in stock prices allow for the estimation of forecast precision and predictions of standard forecast errors (Berg et al., 2003).

VSM minimize the danger of *groupthink*, which can be a problem with traditional forecasting techniques like the Delphi method. VSM are immune to groupthink as traders are constantly in competition and profits can be made when deviating from the estimation of the majority of actors in the market (Hopman, 2007). Finally, VSM implementation and operation are very cost-efficient and VSM are perfectly scalable to integrating large numbers of participants (Spann et al., 2009).

Various companies have already successfully implemented VSM as a forecasting tool: *Google* uses VSM to continuously predict a wide number of developments relevant to the company, ranging from the future number of *Gmail* users to opening dates for new office locations around the world (Sunstein, 2006). *Hewlett Packard* uses VSM to estimate future sales volumes (Chen & Plott, 2002), *Intel's* VSM forecasts customer demand (Hopman, 2007). Probably, the best known example of VSM forecasts is the *Hollywood Stock Exchange (HSX)*:

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