



The Data Center

Executive Summary

Improving Marketing Analytics through Visualization of Spatial Diffusion

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The launch of a new product is a challenging task that every consumer goods firm must face if revenue growth and improved market share is a goal. One of the most important factors influencing new product rollouts involves the geographic forces that affect adoption by individual customers. Commonly called spatial diffusion, this area studies the rate and pattern of adoption for a geographical area based on the frequency and type of advertising, demographics, and distance to retail outlets, along with other elements of the market mix such as pricing, promotion, and tactical product positioning versus competitors. Spatial diffusion is an under-researched area within marketing and has potential to be an innovative decision-making tool for product managers who wish to optimize new product introductions in terms of cost and effectiveness.

Besides the general goal of describing and understanding customer behavior, the study of spatial diffusion also seeks to build mathematical models of the adoption process through time. This model building approach has practical value for retailers and manufacturers in providing guidelines about how consumers adopt new products. Future trends in information technology will allow these models to exist in a network with the prospect of rapid linkage to data for real-time analysis.

While the development of marketing research in the US economy has been a fundamental reason for the growth and sophistication of the consumer goods industry, the introduction of new products into select markets continues to represent an area of great inefficiency in terms of logistics and advertising costs. In a typical product launch, the only sources of near real-time data are point estimates of aggregate demand and consumer feedback from various types of interviews. Both of these data sources do not include the detailed geographical data needed for observation and modeling of spatial diffusion. History-based methods such as share and distribution analysis are valuable market research tools, however, spatial diffusion through its focus on the dynamics of customer behavior along and real-time analysis of data offers much more potential to gain early insight into the success or failure of a new product.

The Data Center, a research group at MIT, has been developing three areas of applied research to improve the ability to use spatial diffusion in practice. First, The Data Center is working on new ways of organizing and linking data to mathematical models. This research area, called semantic modeling, increases the speed that managers can conduct spatial diffusion studies and includes a new computer language called M. Second, researchers are formulating improved mathematical models to predict new product sales based on observed rates of spatial diffusion. This has implications in reducing logistical costs for new products and improving customer service. Finally, The Data Center is taking advantage of recent developments in digital mapping technology to visualize important aspects of spatial diffusion in real time through integration with various animation technologies.

To get a detailed report on marketing spatial diffusion, please send a request to **Edmund_w@mit.edu**. For more information about the work of The MIT Data Center, please go to **www.mitdatacenter.org**, or go to **www.mit.edu** and look under “research labs and centers.”

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