Social Sciences and Humanities

Customer Traffic Flow Modeling in Retail Shops

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Background of Research

The approach broadly taken in this field has been to put considerable effort into attempts to understand the buying behavior of consumers as the basis for preparing a marketing strategy. In the case of consumer goods, extensive research has been undertaken in an attempt to shine light on the mechanism of buying behavior inside stores, taking as one background factor the low level of shoppers' ability to plan ahead. Much of that research focused solely on what was going on literally in the instant when a shopper formed the intention to make a purchase, such as whether to make a purchase or not, and if so, then which brand or product to choose.

It so happens that many shoppers, rather than leave after choosing just one item, often choose to purchase several items one after the other. It would be natural to conclude that there is some sort of connection happening in the course of selection behavior whereby a shopper makes a string of individual choices in this manner. Expressly taking this sort of connection into account has become one issue in research into in-store buying behavior.

Results from this research

The process of shoppers' buying behavior inside retail stores can be pictured as occurring in several stages: moving between sales spaces, approaching specific sales spaces, and selecting specific products (the purchase decision). Our particular research focuses on constructing a mathematical model (customer traffic flow modeling) for and empirical analysis of customers' movement between sales spaces.

As the first step in this research, we embarked on a categorization of earlier research on customer traffic flow analysis to identify its significance and issues (Sato 2010 a). We divided that research into research on methods for measuring customer traffic flow; research on descriptive analysis methods; and research on constructing models, and conducted studies of each. In particular with the research on customer traffic flow modeling, we identified two points, consideration of the heterogeneity between shoppers and consideration of changes in behavior within individuals, as being major issues in our own research.

Sato (2010 b), in order to ascertain heterogeneity in shoppers' buying behavior, employed the Partitioning Around Medoids (PAM) Algorithm, a type of cluster analysis technique, in an effort to prepare a pattern extraction of customer traffic flow. This revealed that there are at least ten characteristic customer traffic flow patterns. This meant that since sales spaces designed to date have been able to accommodate only part of this diverse range of buying behaviors, we recognized that one future issue in practice will be to examine the best approach of responding to other buying behaviors that have not yet received proper consideration.

Prospective developments

Currently, we are distinguishing between the relative degrees of attractiveness of locations and products within stores, and we are also undertaking empirical analysis of in-store buying behavior models that can take account of differences in consumers' characters. Through this series of research projects we hope to obtain suggestions for the design of sales spaces in retail stores.