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# Segmenting Shopping Tourism Market – An Overview of Analytical Techniques and Models

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**ABSTRACT**

*This paper discusses about the analytical techniques and models that can be used for shopping tourism market. This theoretical research attempts to study previous researches as well as the models used by marketing research organizations for effective segmentation. The primary purpose of the study is to identify the appropriate models for segmenting shopping tourism market. The data has been collected from the secondary sources from databases, reputed journals, textbooks, websites, etc. It helps to understand the analytical techniques and models used for market segmentation based on the research issue. Mostly these analytical models are used for psychographic segmentation, to understand the behavioral attitude of the shopper. Hence the study highlights the sequential hierarchy procedure for carrying out market segmentation based on the behavioral pattern of the tourists. Further it provides the scope of each technique for effective segmentation.*

**KEYWORDS : Shopping Tourism Market, Market Segmentation**

## 1. Introduction

The Design of market segmentation concerns whether the market segments are defined by management or the researcher (a priori design) or are based on the responses of the subjects (clustering- based design). A priori segmentation is especially valuable when management has a clear idea about the relevant basis of segmentation. However, it is often difficult to establish a relevant basis for segmentation a priori and to capture the complexities of the market. Once all of the bases for segmentation have been considered, the marketing organization must then decide which descriptors they will use to segment the market and describe their market segments.

This research addresses the analytical models that can be applied to segment shopping tourism market. As there are several issues to be addressed, this research follows scientific approach for defining the various issues in stepwise procedural manner. This research focus on the multivariate analytical techniques to create a base for the segmentation research. The techniques are used to identify the behavior pattern of the tourist and segment them based on descriptors. The demographic descriptors such as age, gender and income are easy to measure but they can be misleading. Psychographic descriptors may be more useful, in particular for lifestyle products. Also the advanced techniques used in previous studies have proven that one person can be in more than one or two segments. These techniques are very effective in segmentation study.

## 2. Objectives of the Study

The main aim of the study is (i) to study and identify the appropriate models for tourist market segmentation study. (ii) to review the base research articles related to segmentation methods, (iii) to understand the application of market segmentation techniques and give directions for further research.

## 3. Methodology

This type of research is theoretical in nature. It examines what type of multivariate techniques can be used for market segmentation. Also it reveals the sequential procedures for market segmentation (Data Preparation, Data Analysis and Data Classification). Moreover it helps to identify the differences in each technique, which helps to satisfy the nature and scope of the study and helps to identify the appropriate technique based on the new research problems. The secondary data has been collected from various databases, journals, books, websites, etc.

## 4. Multivariate Analytical techniques for segmentation

Most multivariate analytical techniques can be used and probably have been used in some way to create post hoc market segments. There is no ideal methodology that works with every segmentation study. Each methodology has advantages and disadvantages. Segmentation studies generally require the use of two or more methodologies to produce the best results. In nearly every case, multiple techniques should be tested before selecting the -best solution. There are 3 categories of analytical techniques applied to market segmentation: data preparation, data analysis, and classification. The most common techniques for each category are:

**Data Preparation**
- Factor analysis
- Correspondence analysis
- Conjoint analysis

**Data Analysis**
- Cluster analysis
- Chi-square Automatic Interaction Detection (CHAID) or Classification and Regression Trees (CART)
- Artificial neural networks
- Latent class structure models

**Classification**
- Discriminant analysis
- Multiple regression
- Multivariate logic
- Multidimensional scaling (MDS)

Each of these analytical techniques, as well as other techniques not listed, can be applied to survey data to produce market segments. Below, we briefly describe how they are often used in segmentation studies.

### 1. Data Preparation

Numerous techniques can be used to aid the segmentation process. Factor analysis can reduce the number of variables to a more manageable size while also removing correlations between each variable. The coordinates produced by correspondence analysis, when calculated at the individual or group level, can be clustered to produce market segments. Correspondence analysis can also be used to convert nominal data (like yes/no answers) to metric scales. Utilities from conjoint analyses can be used in segmentation because they represent the relative value individuals place on all key attributes that define a product or service. In fact, conjoint utilities represent the most effective basis variables because they are derived from respondent preferences between product options or from actual choices of preferred products.

### 2. Data Analysis — Cluster Analysis

Cluster analysis is the most frequently used method of segmenting a market. There is one key difference between clustering and segmenting respondents — clusters produce groups of respondents who have similar responses on key variables while segmentation finds groups of respondents who have similar behaviors when purchasing and seeking products in the market.

Cluster analysis has been used widely in marketing research (Arabie et al. 1981; Arabie and Hubert 1994; DeSarbo 1982a, b; DeSarbo and

Mahajan 1984; Furse, Punj, and Stewart 1984; Mahajan and Jain 1978; Punj and Stewart 1983; Rao and Sabavala 1981; Srivastava, Alpert, and Shocker 1984; Srivastava, Leone, and Shocker 1981). Dickinson (1990) lists more than 400 entries on clustering and latent class analysis techniques

Both hierarchical and iterative cluster analysis procedures can be used, but hierarchical procedures are difficult to evaluate once you exceed 100 or 200 survey respondents. Among the various iterative cluster analysis procedures, the K-Means method is most often used. K-Means cluster analysis can be found in all of the most popular statistical programs (SAS, SPSS, BMDP, Statistica, SYSTAT).

**Data Analysis — CHAID and CART**

CHAID and CART are known as - Classification Tree Methods.|| These methods divide respondents into groups and then further divide each group into subgroups based on relationships between segmenting basis variables and some dependent variable. The dependent variable is usually a key indicator such as usage level, purchase intent, etc. These procedures create tree diagrams, starting at the top with all respondents combined and then branching into 2 or more groups at each new level of the tree. Subdivisions are determined by finding the survey variable that produces the greatest difference in the dependent variable among individual response categories or groups of response categories on that survey variable.

CHAID is the most commonly used classification tree method, but it cannot handle continuous dependent variables so a combination of CHAID and CART is sometimes used. Both CHAID and CART have the ability to process non-metric and non-ordinal data.

Unlike cluster analysis, classification tree methods create true segments when they divide respondents. However, these segments are only based on one dependent variable. Other methods, including cluster analysis, divide respondents based on 10's or even 100's of data elements.

**Data Analysis — Artificial Neural Networks**

Artificial Neural Networks or ANNs offer another means to segment respondents. The Kohonnen architecture is one self-organizing ANN that can be used for segmentation. It is called self-organizing because, like cluster analysis, there is no dependent variable specified in the model. The ANN attempts to group respondents based on their similarities. It differs from cluster analysis in its ability to ignore noisy data. Atypical individuals have less impact on the segmenting calculations and each successive iteration makes ever smaller adjustments to the network weights so the calculations quickly stabilize, ignoring infrequent respondent characteristics. The greater the variation or uncertainty in respondents_ answers, the better ANNs perform compared to cluster analysis.

**Data Analysis — Latent Class Structures**

Latent class analysis is often described as - factor analysis for categorical variables.|| It is used to find underlying constructs within sets of variables. However, latent class analysis can also be used to cluster categorical variables into segments based on responses across a broad range of categorical variables. Latent classes attempt to find the underlying constructs which motivate people to buy a particular product or to desire certain features in that product.

Cluster analysis and latent class analysis are the techniques most frequently used to undertake such market segmentations. Within the realm of cluster analysis, MacQueen's (1967)

In summary, cluster analysis is a popular method for market segmentation based on psychographics, behavior, product ratings, usage information, and perceived needs or benefits. Factor analysis, as a data reduction technique, can support market segmentation as a step prior to the segmentation analysis when there are many related variables used in the analysis. If there is an outcome state (category) that you wish to predict based on customer information, response based segmentation methods can be employed. Traditional statistical methods, discriminant and logistic regression, are used if the predictor or input variables are interval scale, while CHAID analysis (or other tree-based methods) can be performed when the input variables are categorical or discrete. Methods developed outside the areas of traditional statistics (neural networks, rule induction methods) are being successfully applied to clustering and response based segmentation, and given the growing popularity of data mining, we expect they will be used with increasing frequency.

The clustering procedures can be distinguished according to the type of partitioning obtained: nonoverlapping, overlapping, or fuzzy (Hruschka, 1986). In nonoverlapping clustering subjects belong to a single segment only, while in overlapping clustering subjects may belong to multiple segments. In fuzzy clustering the hard membership or non-membership for a subject in one (nonoverlapping) or multiple (overlapping) clusters is replaced by gradual membership indicating the nearness of the subject to the cluster. Overlapping and fuzzy clustering approaches are consistent with the notion that consumers may belong to different segments when they desire to several aspects in a store, possibly in relation to different buying and consumption situations (Howell and Rogers, 1983), (Srivastava,Alpert, and Shocker, 1984). There is a risk of oversimplification and loss of explanatory power when clusters are assumed to be mutually exclusive in store image segmentation research (Arabie et al, 1981).

An integration of cluster based and response based model of segmenting is found rare in the image based segmentation of the retail shoppers. The blend of various techniques and tool for market segmentation will provide us a remarkable contribution to the literature by various means. (i) it can pave way for better understanding on the shopper behavioral segmentation, (ii) it enhances in profiling the segment and (iii) it helps for better prediction by offering the result in equation form or in a set of descriptions form, that can be used for further indentifying and classifying the subject/sample/member likely to fall into the desired target.

**3. Classification Algorithms**

There are a number of classification algorithms or analytical methods which can be applied to market segmentation. Discriminant analysis can be used to classify respondents into predefined segments based on descriptor variables like census data. The segmentation scheme determines which respondents belong in each market segment. The classification or scoring program then creates the means of identifying potential members of each segment based on limited information (usually data which can be obtained from secondary sources). When a limited set of information can be used to accurately predict which market segment each individual belongs, you have a successful classification algorithm. Multiple regression and multinomial logic can be used in the same manner to create classification schemes for market segments.

**5. Conclusion**

This is a review based study on analytical techniques of market segmentation. It has revealed the models and its applications in market segmentation research, from available data sources. The base research can be used for new research problems in studying behavioral pattern. And the researcher can identify the appropriate techniques based on the research issue. The three categories of analytical techniques and its classifications have been identified. The models explain about its scope in market segmentation research and about its usage with dependent & independent variables used for the study. The study clearly specifies what type of scaling should be used for different methods of segmentation. Moreover, it explains the each technique in grouping respondents and dividing into subgroups. These advanced techniques help to segment the market, so that it is easy to identify hard and soft segment. The listed techniques can be applied together i.e. more than one or two techniques applied for a study based on research issue would yield better results for appropriate segmentation. As the tourist shopping pattern is more sensitive in nature (motivation and purchase intention), the advanced analytical techniques could help to segment the market effectively. From a practitioner's perspective segmentation research is pertinent so as to enable to understand changing patterns of tourist behavioral pattern and thereby devise the more appropriate predictive models for effective segmentation.

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