

A KNOWLEDGE BASE FOR BRAND CHOICE MODEL SELECTION

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ABSTRACT: This article introduces a Knowledge Base, which has been created in order to overcome the problem of choosing the right model of consumer choice. With the registration and classification of as many models of consumer choice as possible, a Knowledge Base was created, which gives marketers the opportunity to choose quickly and easily the appropriate model on each occasion, in proportion with consumer characteristics.

KEYWORDS: Knowledge bases, brand choice models, decision support systems

INTRODUCTION

Consumer Choice Models target to model Consumer Purchase Behavior and more specifically, to model the procedure with which consumers make up their mind. Consumer Behavior is one of the most important, dynamic scientific fields in Market Research. With Consumer Behavior analysis, an important number of consumer choice models have been developed, which can be used for the evaluation of important marketing statistics, such as market shares, a brand's purchase probability etc. However, consumers differ to a range of characteristics (personality, preferences, income, sex, etc.), meaning that a model that is appropriate to describe a specific consumer's behavior may be impossible to explain another consumer's behavior. Therefore, a variety of models are required to explain consumer behavior. The problem is that this variety causes a difficulty for choosing the right model in every case, since the literature about these models is vast.

This article introduces the research that was made in order to overcome the problem of choosing the right consumer choice model, and its results. The objects of that research were the following:

1. Registration of as many as possible Consumer Choice Models.
2. Models Classification, in proportion with their conditions, the purchase occasions that they can model and consumer behavior.
3. A Knowledge Base Creation, which will give the possibility to marketers to choose quickly and easily the right model, in every case.

CONSUMER CHOICE MODELS

I. STOCHASTIC MODELS OF CONSUMER CHOICE ^[1, 3, 4, 5, 6, 10, 12, 14]

Stochastic Models of Consumer Choice are being applied at such occasions, that consumer's choice process is stochastic. These models are:

- **Stochastic Models of Purchase Incidence** (NBD Model, Morrison & Schmittlein (1988)) and
- **Stochastic Models of Brand Choice**, which are grouped as below:
 - **Zero Order Models** (Heterogeneous Bernoulli Model, Simple Multibrand Model, Ehrenberg (1972))
 - **Markov Models** (Stationary First Order Markov Process)
 - **Learning Models** (Simple Linear Learning Model, Kuehn (1962), Lilien Model (1974a))
 - **Purchase Incidence Models** (**1st order:** FARQUHAR & RAO (1976), GIVON (1984), LATTIN & McALISTER (1985), PESSEMIER (1978) and **2nd order:** JEULAND (1978), LATTIN (1984), McALISTER (1982), SHARMA & DURAND (1980))
 - **Variety Seeking Models** (**1st order:** JEULAND (1979), MASSY & MONTGOMERY & MORRISON (1970) and **2nd order:** GIVON & HORSKY (1978, 1979), KUEHN (1962))
 - **Reinforcement / Variety Seeking Models** (**2nd order:** KEON (1983))
 - **Combining "Brand Choice" and "Purchase Timing"** (Multinomial / Dirichlet Model, Jeuland, Bass & Wright (1980), Zufryden (1978), Dalal, Lee & Sabavala (1984))
 - **Incorporating Explanatory Variables** (Incorporating marketing variables in Stochastic Brand Choice Model, Kuehn (1978), Givon & Horsky Model (1990))
 - **Stochastic Models and Behavior Rules** (Hemiter Model)

I. PROCESS-ORIENTED MODELS OF THE CONSUMER CHOICE PROCESS. [2, 5, 11, 12]

These models are implemented when consumer choice process is not stochastic, but is oriented of one of the five stages of purchase cycle. Each stage is modeled by next model categories:

1. Need Arousal:

- **Binary Choice Models of Need Arousal** (Hauser Urban Model (1986), Binary Probit Model, Binary Logit Model, Linear Probability Model, Arctan Model)

2. Information Search:

- **Models of Brand Awareness** (Blattberg & Jeuland (1981))
- **Models of Consideration Set Formation** (Compensatory Model of Consideration, Roberts & Lattin (1991))
- **Information Integration** (Hagerty & Aaker Model (1984))

3. Evaluation:

- **Perceptual-Evaluation Models:**
 - **Multidimensional Scaling** (Single Mode, Nonmetric Scaling, Two-Mode Multidimensional Scaling, Moore & Winer Application (1987))
 - **Factor Analysis**
- **Models of Attitude:**
 - **Compensatory** (Fishbein Model (1963), Belief/Importance Model, Extended Fishbein Model, Ideal-Point Model) and
 - **Non-Compensatory** (Conjunctive Model, Disjunctive Model, Lexicographic Model)

4. Purchase Decision:

- **Multinomial Binary Choice Models** (Luce's Model, Lesourne Model (1977), Multinomial Logit Model, Low Reinforcement Model, Nested Logit Model)
- **Markov Models.**

5. Post-purchase feelings:

- Models of Variety Seeking (Lattin & McAlister Application (1985))

I. USEFUL NEW CONSUMER CHOICE MODELS

Some lately developed models are based on previous classic consumer choice models and they solve with new methods problems such as heterogeneity of the population.

(A Multiplicative Fixed-effects Model of Consumer Choice, Purushottam Papatla (1996) ^[11], Modeling Preference and Structural Heterogeneity in Consumer Choice, Kamakura, Kim, Lee (1996) ^[16], A Framework for Investigating Habits, Purchase Feedback and Heterogeneity in Dynamic Brand Choice, Roy, Chintagunta & Haldar (1996) ^[13], A Segment-level Model of Category Volume and Brand Choice, Dillon & Gupta (1996) ^[17], Capturing Dynamic Brand Choice Processes in Turbulent Consumer Goods Markets, Erdem & Keane (1996) ^[15], Incorporating Demographic Variables in Brand Choice Models: An Indivisible Alternatives Framework, Kalyanam & Putler (1997) ^[7], A Non-parametric Density Estimation Method for Brand Choice Using Scanner Data, Makoto Abe (1995) ^[9], Testing New Direct Marketing Offerings: The Interplay of Management Judgment and Statistical Models, Vicki G. Morwitz & David C. Schmittlein (1998) ^[18]).

KNOWLEDGE BASE FOR CHOOSING A CONSUMER CHOICE MODEL

The criteria that can lead the decision-maker to the right model were detected from the classification of the models, and based on these criteria we created the Knowledge Base.

That Knowledge Base gives to decision-maker the possibility to choose quickly one of the 26 models, that are contained in the Knowledge Base, with the requirement only that decision-maker has some basic marketing learning. These learning are necessary for understanding the criteria contained in Knowledge Base, so that can be possible to answer all the questions. An also important requirement for model implementation is the collection of necessary data. Decision-maker has to study very well the case that he wants to model and also he has to collect some information, as for example the market shares about the product type he is interested in the past time interval.

Decision-maker, using the Knowledge Base can conclude to a consumer choice model, by answer to the questions. If the data that Knowledge Base requests is not available or the combination of criteria values does not lead to a model contained in the Base then the Knowledge Base doesn't suggest any model. In that case the Knowledge Base suggests to decision-maker to reconsider some questions, so that he may choose an alternative model.

The reported Knowledge Base for choosing a consumer choice model is going to embodied to an Intelligent Marketing Decision-Making System, named MARKEX (Matsatsinis and Sisikos, 1999). This system invoked an innovating methodology of new product development, which is based on consumer behavior studying. MARKEX gives to decision-maker a new completed methodology, which supports him at all phases of new products development, contrary to existing systems which are in a prototype form, their knowledge bases are limited and they accomplish only some phases of the whole process of the development.

CONCLUSIONS

At this study we made a bibliographic research for consumer choice models and then we registered and classified these models by such characteristics as the method that they face heterogeneity of the population, the stage of purchase cycle they model, etc.

The choice of the most appropriate consumer choice model is a complicated process, that requires much time and studying, since consumer behavior is manifold and models which have been developed by marketers are many and complicated. The difficulty of this choice caused the need for developing of the Knowledge Base, which leads to the right model choice, through a relatively simple procedure.

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